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COMMERCIAL FISHERIES REVIEW

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UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Commercial Fisheries
Washington, D.C.

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COMMERCIAL FISHERIES REVIEW

A review of developments and news of the fishery industries prepared in the BUREAU OF COMMERCIAL FISHERIES.

Joseph Pileggi, Editor
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Use of funds for printing this publication has been approved by the Director of the Bureau of the Budget, May 1, 1963.

5/31/68

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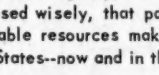

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Price 60 cents (single copy). Subscription Price: $5.50 a year; $2 additional for foreign mailing.

COMMERCIAL FISHERIES REVIEW

May 1964 Washington, D. C. Vol. 26, No. 5

SECOND WORLD FISHING GEAR CONGRESS

By Edward A. Schaefers* and Dayton L. Alverson**

On May 25, 1963, the Second World Fishing Gear Congress, arranged by the Food and Agriculture Organization of the United Nations, convened in London, England. Six years had elapsed since the First World Fishing Gear Congress, also arranged by FAO, convened in Hamburg, Germany. Some 600 delegates from 50 countries registered for the Second Congress at which 87 technical papers were presented and discussed during the five days of technical sessions (May 27-31).

To facilitate presentation and discussion, papers were divided, by natural classifications, into three main subjects: Materials, Gear and Fishing, and Gear Research. Each of these majors subjects included a wide variety of topics. Rapporteurs from various countries were chosen to summarize one or more topics under each major subject.

MATERIALS

The discussion on materials centered around a review of the most widely used synthetic fibers which play such an important role in today's fisheries. Three topics, knotless netting, the use of monofilament nets, and new net materials, received the greatest emphasis. In contrast to the 1957 Gear Congress, when a host of new synthetic fibers were being incorporated into fisheries, only one new synthetic fiber, polypropylene, was discussed in detail at the 1963 Congress. Experiments with this material have resulted in favorable catches during fishing trips in Japan, England, Germany, and the United States. These results suggest increased use of this fiber in fisheries. The introduction into fisheries of only one new synthetic net material in the past several years is not surprising considering the wide group of synthetic fibers which were introduced and adopted prior to 1960. When those materials were first tried by various fisheries their efficiency was judged by comparing their physical and chemical properties with those of natural fibers. Synthetics having desirable characters were soon adopted into world fisheries. Accordingly, new net materials must now compete with high-quality, well-proven synthetic twines, and must have characteristics which make them more suitable for use in fisheries than existing synthetic twines.

The most striking change in the discussion on synthetic fiber materials between the 1957 and 1963 Gear Congresses was the complete acceptance at the latter Congress of synthetic fibers as the dominant material used for net construction. During the 1957 Congress synthetic fibers for fishing nets were relatively new. Considerable debate occurred as to the desirability of synthetic materials for use in various fisheries and as to the comparative merits of natural and synthetic fibers.

In Japan, where synthetics were introduced into the fishing industry in 1949, the use of those fibers for fabrication into fishing nets has increased at a tremendous rate and by 1959 a total of 21.2 million pounds were reported as having been used. Two years later, in 1961, use of synthetics for nets had risen to 30.7 million pounds (table). Correspondingly, there has been a decrease in the use of natural fibers for netting in Japan--from 28 million pounds

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U. S. DEPARTMENT OF THE INTERIOR
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Japanese Production of Synthetic Fibers for Fishing Nets, 1955, 1957, 1959, and 1961

Product	1961	1959	1957	1955
	(1,000 Lbs.)			
Synthetic Fibers:				
Nylon	12,749	8,314	6,123	3,535
Vinylon	12,679	8,923	7,410	3,890
Polyvinylidene chloride	1,393	1,467	1,388	1,148
Polyvinyl chloride	574	1,056	931	-
Polyester	238	-	-	-
Polyethylene	1,716	-	-	-
Twisted blended yarn of filament	1,333	1,452	1,089	42
Total synthetic fibers	30,682	21,212	16,941	8,615
Natural Fibers:	4,413	10,668	13,869	24,781

Source: "Synthetic Fibre Fishing Nets and Ropes Made in Japan," by Japan Chemical Fibres Association, Tokyo, Japan (see Appendix).

in 1949 to only 4.4 million pounds in 1961. With regard to Japanese synthetic fiber fishing nets for export, the total soared from 383,000 pounds in 1955 to 10.6 million pounds in 1961, and found markets in more than 100 nations. The delegates were quite surprised to learn that while conversion to synthetics was 85 percent for netting, about 90 percent of the ropes used are still of natural fibers. Although the trend in Japan is perhaps somewhat more dramatic than that which has occurred in other fishing nations, the use of synthetics as compared to natural fibers for nets has followed the same general trend throughout the world.

Knotted netting is still the main material used in net construction by the fishing industry throughout the world. Knotless netting, however, is becoming increasingly important. Knotless netting is currently produced in two types; the Japanese twisted type and the Raschel knitted type. In Norway, West Germany, Belgium, Peru, and the United States, the major increase in use of knotless netting has been in the Raschel type. The manufacture of this type is based on the Raschel-technique, well known in curtain material manufacture for at least 100 years. The use of Raschel-type netting in Norwegian fisheries increased from 17 tons in 1960 to approximately 200 tons in 1962.

No detailed discussion occurred concerning the differences in catchability between knotless and knotted webbing. The major advantage of knotless webbing was reported to be its lower cost. For example, in Norway purse seines made from small-mesh knotless netting were reported to be from 25 to 30 percent cheaper than those made from knotted netting. With increasing mesh size, however, a point is reached when knotted netting can currently be produced more economically. It was also brought out that in Peru, 75 of the 1,200 purse seines now in operation are made of knotless netting, and that a new factory was recently established there which should produce 400 tons of Raschel knotless netting each year.

Monofilament netting was also predicted to play an increasingly important role in world fisheries, particularly in gill-net fishing for species currently underutilized. In Viet Nam, monofilament netting is already the most popular material used for gill nets, outnumbering multifilament gill nets 8,000 to 160.

It was emphasized throughout the discussions on synthetic materials that it is most important not to generalize concerning the effectiveness of specific types of synthetics, particularly when the generalizations were derived from experiments in only one fishery and in one geographic area. Success of synthetics in one area or fishery does not insure its success in similar fisheries in other areas.

GEAR AND FISHING

Topics under the subject Gear and Fishing ranged from stern trawling to fish detection. A considerable portion of the time available for discussing fishing gear and fishing methods was devoted to stern, midwater, and bottom trawling. The predilection for trawling obviously

resulted from the large number of participants at the meeting from nations where trawling represents a major harvesting technique. For example, in Great Britain more than 70 percent of the fish landed are taken with trawls.

A considerable portion of the time spent in discussing stern trawling was devoted to smaller vessels ranging in length from 70 to 100 feet. Particular attention was drawn to the 83-foot United States combination stern trawler-purse seiner Narragansett and to the 99-foot English stern trawler Ross Daring. The high degree of automation and extensive use of centralized controls by both those vessels allows considerable reduction in manpower while improving handling procedures. The Narragansett, for example, is designed to operate with only three fishermen, while the Ross Daring is capable of operating with five.

Although some disagreement occurred concerning the desirability of increased mechanization and centralized controls aboard fishing vessels, the opponents of mechanization failed to convince the majority. But it was obvious that the mechanization trend will continue (fig. 1). In fact, it was the opinion of many of the delegates that the main key to the survival of the fishing industry as a business proposition is a continual increase in automation and mechanization aboard fishing craft. Such increases in automation must lead to greater productivity for fishermen.

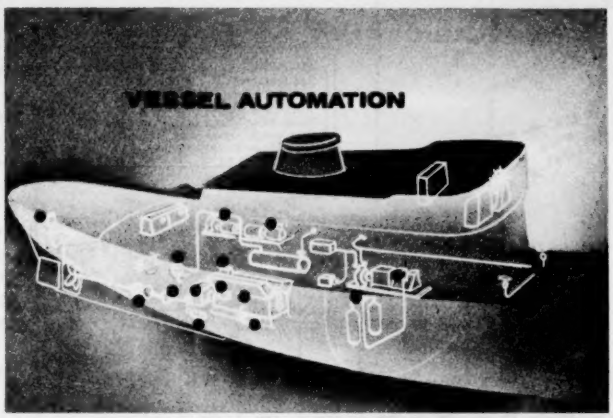

Fig. 1 - Vessel automation--circles indicate operations that can be automated or remotely controlled aboard fishing vessels.

The advancements indicated in bottom trawling since the 1957 Fishing Gear Congress were disappointing and only one real breakthrough occurred which appears to offer any real possibilities of improving efficiency or effectiveness of this method of fishing. This concerns developments in the use or application of electricity to bottom trawls for capturing bottomfish and shrimp. Experiments with electrical trawls were regarded as offering significant possibilities of improving their catching ability. The use of electricity to bring about galvanonarcosis of fish in front of the trawls was reported to increase the catching efficiency, depending on species, from about 100 to 500 percent.

A paper describing possibilities of improving the capture of shrimp which burrow during daylight hours by applying an electrical shocking system to the trawl, was one of the more impressive contributions involving trawling. The results of the electrical shocking caused shrimp to rise from their burrows to where they were susceptible to being captured by the trawl.

Although considerable attention was given to midwater trawling, advancements in that method of fishing since 1957 had not occurred at a pace which investigators had desired. Delegates, who anticipated hearing of Japanese midwater trawling experiments in the eastern China Sea, were disappointed as that paper was not assembled in final form before the meeting adjourned. It was reported, however, that midwater trawls had been used to capture shrimp in the eastern China Sea with considerable success. It was stated that some 200 Japanese vessels are now engaged in midwater trawling for shrimp in that area. Midwater trawling is carried out as a single boat operation with vessels of approximately 370 tons using a trawl with a 160-foot headline; pair trawling is conducted from two smaller bull trawlers working side-by-side using a net with a 200-foot headline. The success of the Japanese midwater shrimp trawling appears to be keyed to accurate vertical control of the net which is achieved through use of an acoustical device which records in the wheelhouse the depth that

the net is fishing. Considerable discussion occurred on the effectiveness of one-boat versus two-boat midwater trawling. It would appear that in spite of several successful one-boat operations that, in general, two-boat midwater trawling had been more productive from a commercial standpoint.

A notable change was apparent in the concept of the use of midwater trawls. Some of the more vigorous proponents of midwater trawling, who previously viewed that gear as a panacea for the problems confronting bottom trawling, now look on midwater trawls as tools to be used interchangeably with bottom gear. Thus, when conditions appear appropriate for use of midwater trawls, that is, when fish appear to be congregated in dense schools above the bottom, this type of gear would be used. In other circumstances, however, conventional bottom gear would be employed.

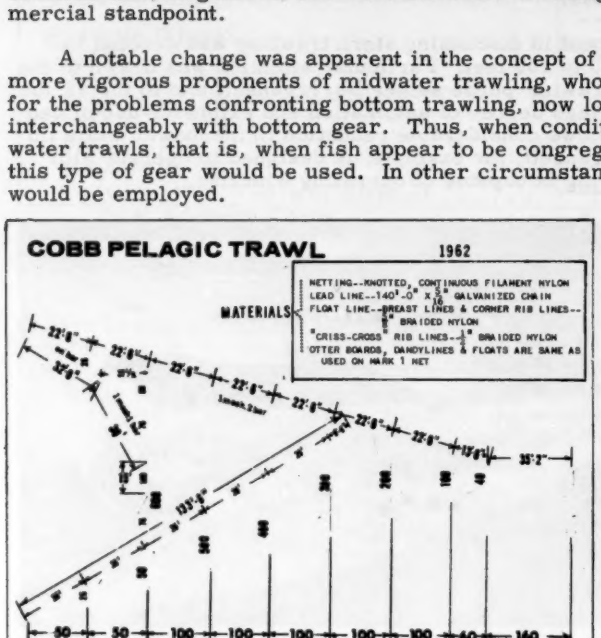

Fig. 2 - Extremely large midwater trawl being developed in the United States and designed to be towed at slow speeds. Most previous efforts have been towards development of small midwater trawls to be towed at high speeds.

An extremely large midwater trawl developed in the United States was discussed in some detail (fig. 2). This trawl was designed primarily to evaluate whether or not relatively fast-swimming pelagic species could be captured in midwater trawls. The gear achieved some success in that bonita, barracuda, mackerels, and other relatively rapid-swimming species were taken. The gear is at present, however, considered successful only as a biological sampling tool although alterations and continued experiments with the gear are designed toward developing a successful commercial net.

It was apparent that most people were impressed with the rather significant improvements in fish-detecting devices in recent years, particularly for distinguishing schooling species just off the bottom and for horizontal echo-ranging. The efficient use of modern echo-sounding equipment for fish detection and fishing tactics has become an important part of many fisheries. Although there have been considerable improvements in the sensitivity and resolution of acoustical devices, the improvements have been paralleled by increased difficulty in interpretation and operation, these requiring specialized training and greater skill in the fishermen who use them. In the Norwegian fisheries the need for training in sonar operation has become an urgent matter, and several years ago instruction courses were organized. Those courses, which originally required eight days of training, are expected to be lengthened. The present course given in Norway has the objective of training operators in proper use of the equipment and to classify and identify echo traces.

In addition to fish detection through echo-sounding, airplane spotting was discussed at considerable length, although not a single paper was prepared on the subject. This technique is used rather widely on both coasts of North America, and on the west coast of South America. In Chilean fisheries some operators reported that one spotter plane could successfully be employed to assist ten catcher vessels.

Fleet operations involving motherships, although certainly not new, were the subject of considerable debate. Such operations are now carried out in practically all major oceans. Although fleet operations of that type date back some 300 years, there has been a rapid expansion and buildup of fleet operations throughout the world in recent years. Such operations are now directed toward capture of a great variety of species including bottomfish, king crab, tuna, and sardine-like fishes. Although a distinct trend has occurred among European nations

toward operation of independent freezer trawlers and factory trawlers, this method has not proved successful in all instances. It was felt that where it is necessary to carry out fishing operations at considerable distances from home ports (greater than 4,000 miles), mothership operations are more successful.

There was little if any evidence of a major breakthrough in changes or mechanization in the handling of long-line gear. An interesting paper on the mechanization of dropline fishing at depths of 500 fathoms in the South Pacific, however, received favorable comment (fig. 3). An excellent example of mechanization of a fishery, however, was provided in a paper describing Alaskan king crab operations. This fishery produced approximately 50 million pounds of king crab from a fleet of about 200 vessels in 1962. The success of the fishery can be attributed to the efficiency of the modern king crab pot and to methods used in handling and hauling pots with gypsy winches or V-grooved hydraulic pot haulers. Alaska king crab pots measuring 7 feet x 7 feet x 2½ feet and weighing approximately 200 pounds each are commonly used. Some of the pots have caught over 200 crabs thus giving the pot and its contents a total weight of approximately 2,200 pounds. On an average, however, 50 crabs per pot is considered good fishing.

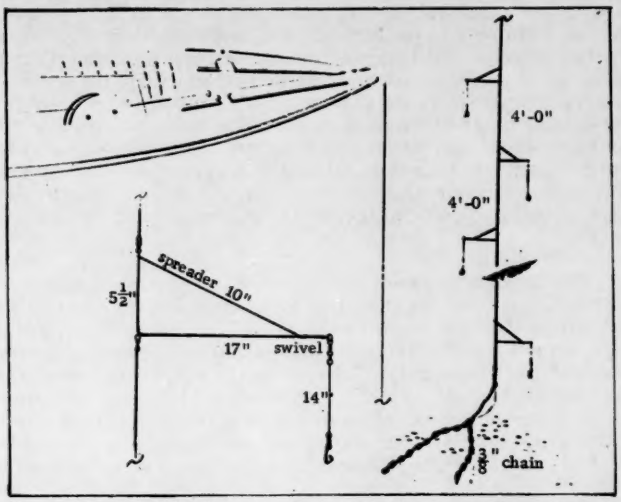

Fig. 3 - Mechanized dropline gear--steel wire leads over bow of vessel to gurdy drum powered by small gasoline engine.

Although only one document was presented at the conference describing purse-seining techniques, considerable discussion was initiated from the floor concerning purse-seine activities, with particular attention devoted to the South American anchovetta fishery and the United States tuna operation. It was noted that in the case of the United States tuna fishery an almost complete conversion from the previous pole-and-line method occurred. In other fisheries minor modifications and adjustments in purse-seine techniques have resulted in more effective operations. In general, the increased efficiency in seining operations has been attributed to the adoption of power-hauling techniques (generally the power block), synthetic twines, and more effective methods of fish detection. In purse-seining operations, fish detection includes the use of aircraft and horizontal-scanning techniques. Delegates pointed out the necessity of adapting purse-seine operations to local conditions and to varying fishing tactics depending on species being sought.

GEAR RESEARCH

The final topics of the gear congress were under the subject of Gear Research. Topics discussed included instrumentation, fish behavior, application of telemetry and computers to fisheries problems, and finally, a look into the future of fishing.

The session considering instrumentation and dynamics of fishing gear was involved with methods of measuring the various forces acting upon towed fishing gear, primarily trawls. Various studies conducted in Japan, Norway, and England on the resistance of netting, trawl doors, warps, and other components of the gear related numerous facts (some conflicting) concerning the most effective design for trawls. Some of the varying opinions concerning efficient trawl design presumably result from differential behavior patterns of species sought. The progress in instrumentation, however, appears to be on the verge of contributing several devices which may be used by commercial fishermen in the near future. Possible devices in-

clude on-bottom indicators, cod-end load indicators to determine the quantity of fish captured, and automatic positioning and control devices for midwater trawls.

Improvement in the array of fishing devices currently available to fishermen in the future is perhaps largely dependent on the accrual and advancement of the knowledge of fish behavior. There can be little doubt that considerable emphasis was placed during the Congress on fish behavior and the importance of determining diurnal, seasonal, and geographic behavior patterns of species, as well as behavior to fishing gear and physical or chemical stimuli. It was quite evident from discussions that gear technologists, biologists, net manufacturers, and fishermen must be cognizant that successful design of fishing gear will require more data on the behavioral characteristics of various species sought. This field has been neglected to some extent by gear technologists as greater emphasis was placed on physical engineering properties of gear and the behavior of the gear itself. To be effective, however, the engineering and physical characteristics of gears must be considered along with behavioral aspects of fishes.

Preliminary experiments involving the reaction of commercial species of fishes such as herring, cod, whiting, and haddock, indicate that of the various stimuli produced by stationary and moving gears, visual responses are the most important and therefore determine to a large degree the effectiveness of fish-capturing devices. For example, in daylight it was observed that fish in the vicinity of the seabed respond to towed trawls by swimming away from the gear along its path and there was no evidence of avoiding the gear by swimming upwards. In midwater gear, however, avoidance was sometimes effected by sounding or moving downward in the water column. In darkness, those responses did not appear to take place, and the orientation and movement away from the gear were much less pronounced.

The various papers presented and the resulting discussions indicated that considerable knowledge is being compiled and assembled from fishermen and scientific investigators on the general behavior patterns of marine commercial species. There are, however, many unknowns concerning detailed behavior responses of fish to natural environmental and artificial influences. It is obvious that greater emphasis is now being placed by marine scientists on conducting experiments on the behavioral aspects of fish in their natural environment, rather than in tanks ashore, which has been the case in the past.

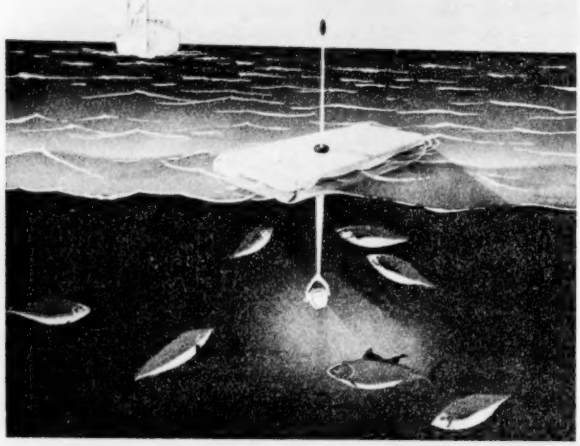

Fig. 4 - "Artificial log" would be designed to attract and detect schools of pelagic fish and relay to a catcher vessel information on concentrations of fish in vicinity of the "log."

Future harvesting methods and the possible applications of high-speed computers and associated elements of automatic data processing to the fishing industry were the final topics of the Congress. It was reported that at least one United States fishing company is currently using computer techniques and that high-speed digital computers have been utilized by some shipbuilders to resolve form lines.

Future concepts of fishing were discussed with emphasis being placed on the need to adapt engineering principles employed in industry, military, and space fields. Improvements in the next several decades visualized possible systems that might be employed to increase harvest of living resources of the seas. Those discussed included retrievable buoys with built-in detection systems which could automatically signal a catcher vessel of the presence of fish. Artificial logs were

suggested for attracting fish. Those would also have built-in detection systems for automatically signaling a catcher vessel when commercial concentrations of fish were present (fig. 4). A network of oceanographic buoys was envisaged which would detect and transmit their data through satellite telemetry to a shore site "hydro-central." The data would be collated, analyzed, and transmitted back via facsimile methods to fishing vessels and to various fishing centers throughout the world. Also discussed was the possibility of application to fishing vessels and fishing gear of lightweight materials developed for space vehicles.

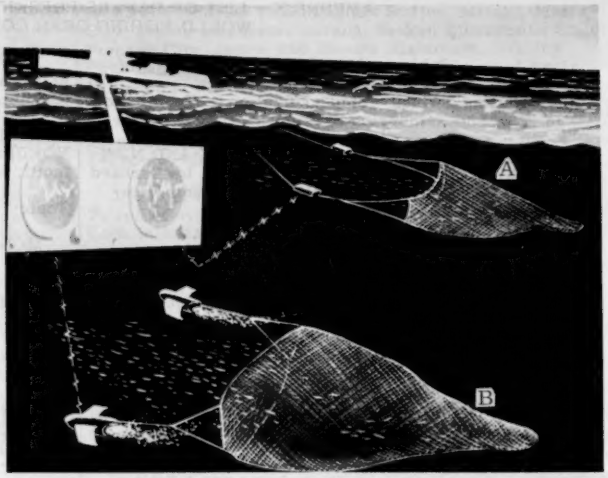

Fig. 5 - Possible futuristic midwater trawling:
A--Midwater trawl with powered spreading devices controlled from bridge through electrical conductors.
B--Midwater trawling with self-contained power units remotely controlled from vessel.

CONCLUSIONS

In reviewing the various papers presented and considering the discussions which were initiated from the floor by the delegates, it was obvious that some basic changes had occurred in concepts of fishing since the first Congress was held in Hamburg in 1957. At the 1957 Congress stern trawlers were just entering fisheries and they were the subject of considerable debate. Their success was doubted in many instances and many looked upon them as exotic experimentation. At the 1963 Congress, however, they were an accepted and important constituent of the modern trawling fleets and there could be little doubt of their continued and expanded use. Synthetics, which were also a somewhat new commodity in fisheries at the 1957 Congress, have since been universally accepted.

The 1963 Congress perhaps did not provide any major breakthroughs of proven commercial feasibility in new systems of harvesting fish and other living resources, but there was strong evidence of the realization for the necessity of applying modern engineering concepts to fisheries, to automation of fishing vessels, and the need to strike out boldly into new frontiers with radically new fish-capturing devices. To help resolve those problems, greater emphasis is being directed toward understanding fish and their reaction to natural and artificial stimuli. It would seem that by the time of the next fishing gear congress, research in those fields will have been instrumental in developing entirely new tactics for application to fisheries throughout the world.

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The "Appendix - List of Papers Presented at the Second World Fishing Gear Congress," appears on pages 8-11.

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APPENDIX - LIST OF PAPERS PRESENTED AT THE SECOND WORLD FISHING GEAR CONGRESS

Subject: MATERIALS

Topic: Netting Twines - Standardization of Terminology and Numbering Systems

STANDARDIZATION OF TERMINOLOGY AND NUMBERING SYSTEMS FOR NETTING TWINES, by Gerhard Klust, Institut für Netz- und Materialforschung, Hamburg, Federal Republic of Germany.

Topic: Standardization of Testing Methods

TEST METHODS FOR FISHING GEAR MATERIALS (TWINES AND NETTING), Edited by A. von Brandt, Institut fur Netz- und Materialforschung, Hamburg, Federal Republic of Germany. Revised by P.J.G. Carrothers, Fisheries Research Board of Canada, St. Andrews, New Brunswick, Canada.

Topic: New Net Materials

POLYPROPYLENE TWINES IN JAPAN, by Katsuji Honda, Professor Tokyo University of Fisheries, Tokyo, Japan, and Shigeru Osada, The Nippon Gyomo Sengu Kaisha Ltd., Tokyo, Japan.

SYNTHETIC FIBRE FISHING NETS AND ROPES MADE IN JAPAN, by Japan Chemical Fibres Association, Tokyo, Japan.

THE USE OF "ULSTRON" POLYPROPYLENE IN THE FISHING INDUSTRY, by C.L.B. Carter and K. West, Fibres Division, Imperial Chemical Industries Ltd., Harrogate, Yorkshire, England.

PRODUCTION AND CHARACTERISTICS OF SYNTHETIC NETS AND ROPES IN JAPAN, by Yoshinori Shimozaki, Tokai Regional Fisheries, Research Laboratory, Tokyo, Japan.

ETUDES SUR LE FREINAGE ET L'USURE DES FILS DE PECHE, by Maurice Bombeke, Etablissements Cousin Frères, Wervicq-sud, France.

NETTING TWINES MADE OF POLYPROPYLENE AND POLYAMIDE, A COMPARISON OF THEIR PROPERTIES, by Gerhard Klust, Institut für Netz- und Materialforschung, Hamburg-Altona 1, Federal Republic of Germany.

NEW SYNTHETIC MATERIALS FOR HERRING DRIFTNETS USED IN THE NORTH SEA, by Janusz Zaucha, Sea Fisheries Institute, Gdynia, Poland.

Topic: Lines and Ropes

ROPES OF POLYETHYLENE MONOFILAMENTS, by C. C. Kloppenburg, Kunstzijdespinnerij "Nyma" N.V., Nijmegen, Netherlands, and J. Reuter, Nederlandsche Visserij-Proefstation en Laboratorium voor Materialen-Onderzoek, Utrecht, Netherlands.

Topic: Knotless Nets

KNOTLESS NETTING IN THE NORWEGIAN FISHERIES, by Norvald Mugaas, Statens Fiskeredskapsimport, Bergen, Norway.

TESTS ON KNOTLESS RASCHEL NETTING, by A. von Brandt, Institut für Netz- und Materialforschung, Hamburg, Federal Republic of Germany.

KNOTLESS FISHING NETS PRODUCED ON RASCHEL EQUIPMENT IN ITALY, by Mario Damiani, Societa Rhodiatoce S.p.A., Milan, Italy.

RESISTANCE A LA RUPTURE DE FILETS SANS NOEUDS, by Francesco Pianaroli, Retificio Carlo Badinotti, Milan, Italy.

Topic: Monofilament Nets

MONOFILAMENTS IN FISHING, by W. Henstead, British Celanese Ltd., Coventry, England, and D.F.C. Ede, British Resin Products Ltd., Piccadilly, London, England.

THE USE OF NYLON MONOFILAMENT IN THE VIET-NAM FISHERIES, by Tran-Van-Tri and Ha-Khac-Chu, Fisheries Directorate, Saigon, Viet-Nam.

MONOFILAMENT GILLNETS IN FRESHWATER FISHING--EXPERIMENTAL AND PRACTICAL RESULTS, by R. Steinberg, Institut für Netz- und Materialforschung, Hamburg-Altona 1, Federal Republic of Germany.

Subject: GEAR AND FISHING

Topic: Stern Trawling

THE STERN TRAWLER - A DECADE'S DEVELOPMENT IN TRAWL HANDLING, by Conrad Birkhoff, Fischereitechnische Konstruktionen, Hamburg 13, Federal Republic of Germany.

SOME SMALL STERN TRAWLERS, by E.C.B. Corlett, Burness, Corlett & Partners Ltd., Basingstoke, England.

ROSS DARING - EXPERIMENT, by Dennis Roberts, Ross Trawlers Ltd., Grimsby, England.

Topic: Bottom Trawling with High Opening Nets or Low and Wide Opening Nets

DEVELOPMENT OF AN IMPROVED OTTER TRAWL GEAR, by Chikamasa Hamuro, Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

SUGGESTIONS FOR IMPROVED HEAVY TRAWL GEAR, by Eldon Nichols, American Telephone and Telegraph Company, 32 Avenue of the Americas, New York, New York, U.S.A.

FLEET TRAWLING OPERATIONS, by Hiroshi Tominaga, 4, 1-Chome, Marunouchi, Chiyoda-Ku, Tokyo, Japan.

THE DEVELOPMENT OF ELECTRICAL SHRIMP TRAWLING GEAR, by Fredrick Wathne, U. S. Bureau of Commercial Fisheries, Gear Research Station, Panama City, Florida, U.S.A.

JAPANESE FISH NETTING OF SYNTHETIC FIBRES, by Iwao Tani, Japan Synthetic Fibre Net and Rope Association, Echizenbori, Chuo-ku, Tokyo, Japan.

TOWING POWER, TOWING SPEED AND SIZE OF BULL TRAWL, by Chikamasa Hamuro, Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

DOUBLE-RIG SHRIMP BEAM TRAWLING, by J. Verhoest, Commissie T.W.O.Z., and A. Maton, Rijkstation voor Boerderijbouwkunde; both of the University of Agriculture, Ostend, Belgium.

SOME COMPARATIVE FISHING EXPERIMENTS IN TRAWL DESIGN, by W. Dickson, Department of Agriculture and Fisheries for Scotland, Marine Laboratory, Torry, Aberdeen, Scotland.

SOME OF THE GENERAL ENGINEERING PRINCIPLES OF TRAWL GEAR DESIGN, by P. R. Crew, Westland Aircraft Ltd., Saunders-Roe Division, East Cowes, Isle of Wight, England.

DEVELOPMENT OF SOVIET TRAWLING TECHNIQUES, by A. I. Treschev, Institute of Marine Fisheries and Oceanography (VNIRO), Moscow, U.S.S.R.

Topic: Midwater Trawling

DEVELOPMENT OF THE COBB PELAGIC TRAWL--A PROGRESS REPORT, by Richard L. McNeely, Exploratory Fishing and Gear Research Base, Bureau of Commercial Fisheries, Seattle, Washington, U.S.A.

REACTION OF HERRING TO FISHING GEAR STUDIED BY MEANS OF ECHO SOUNDING, by H. Mohr, Institut für Netz- und Materialforschung, Hamburg, Federal Republic of Germany.

UNDERWATER TELEMETERS FOR MIDWATER TRAWLS AND PURSE SEINES, by Chikamasa Hamuro and Kenji Ishii, Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

TWO-BOAT MIDWATER TRAWLING FOR HERRING WITH BIGGER BOATS, by Rolf Steinberg, Institut für Netz- und Materialforschung, Hamburg, Federal Republic of Germany.

UNIVERSAL ONE-BOAT MIDWATER AND BOTTOM TRAWL, by S. Okonski, Sea Fisheries Institute, Gdynia, Poland.

ONE-BOAT MIDWATER TRAWLING IN GERMANY, by J. Scharfe, Institut fur Netz- und Materialforschung, Hamburg, Federal Republic of Germany.

SOME NOTES ON THE IMPORTANCE OF BIOLOGICAL FACTORS IN FISHING OPERATIONS, by B. B. Parrish and J.H.S. Blaxter, Marine Laboratory, Aberdeen, Scotland.

Topic: Gill-netting

JAPANESE SALMON MOTHERSHIP FISHERY, by Masatake Neo, Nichiro Gyogyo Kaisha Ltd., Marunouchi Bldg., Tokyo, Japan.

DRIFTNET HAULERS FOR SALMON FISHING, by Chihiro Miyazaki, Tokai Regional Fisheries Research Laboratory, Tokyo, Japan.

MECHANIZATION OF DRIFTNET FISHING OPERATIONS, by P. A. Kuraptsev, Institute of Marine Fisheries and Oceanography (VNIRO), Moscow, U.S.S.R.

Topic: Long-lining

ECHO-SOUNDER MEASUREMENT OF TUNA LONGLINE DEPTH, by Kyotaro Kawaguchi, Kanagawa Prefectural Fisheries Experimental Station, Misaki, Miura City, Japan; Masakatsu Hirana, Sanken Electronics Co., Numazu City, Japan; and Minoru Nishimura, Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

MOTHERSHIP BOTTOM LONGLINE FISHERY, by Hiroshi Tominaga, Taiyo Gyogyo Kabushiki Kaisha, 4, 1-Chome, Marunouchi, Chiyoda-Ku, Tokyo, Japan.

DROPLINE FISHING IN DEEP WATER, by Ronald Powell, Government of the Cook Islands, Raratonga, Cook Islands.

Topic: Traps, Pots, and Dredges

EEL TRAPS MADE OF PLASTIC, by H. Mohr, Institut für Netz- und Materialforschung, Hamburg, Federal Republic of Germany.

TYPES OF PHILIPPINE FISH CORRALS (TRAPS), by Arsenio N. Roldan, Jr., and Santos B. Rasalan, Philippine Fisheries Commission, Diliman, Quezon City, Philippines.

A NEW FISH TRAP USED IN PHILIPPINE WATERS, by Santos B. Rasalan, Philippine Fisheries Commission, Diliman, Quezon City, Philippines.

LES MADRAGUES ATLANTIQUE ET SICILIENNE, by Vito Fodera, FAO/EPTA Fishery Adviser, Tunis, Tunisia.

KING CRAB POT FISHING IN ALASKA, by Robert F. Allen, Marine Construction and Design Company, Seattle, Washington, U.S.A.

Topic: Purse Seining

SONAR INSTRUCTION COURSES FOR FISHERMEN, by G. Vestnes, Fiskeridirektoratets Havforskningsinstitutt, Bergen, Norway.

RECENT DEVELOPMENTS IN ICELANDIC HERRING PURSE SEINING, by Jakob Jakobssen, Atvinnudeild Háskólans Fiskideild, Reykjavik, Iceland.

Topic: Deck Machinery

SOME SMALL STERN TRAWLERS, by E.C.B. Corlett, Burness, Corlett & Partners Ltd., Basingstoke, England.

THE APPLICATION OF HYDRAULIC POWER TO FISHING GEAR, by D. W. Lerch, Marine Construction and Design Company, Seattle, Washington, U.S.A.

THE COMPLEX MECHANIZATION OF BEACH SEINING, by S. S. Torban, Institute of Marine Fisheries and Oceanography (VNIRO), Moscow, U.S.S.R.

Topic: Controls

ADVANCES IN CENTRALIZED CONTROL AND AUTOMATION, by H. E. H. Pain, Marine & Navigation Division, S. G. Brown Ltd., Watford, England.

Topic: Fish Detection

DETECTEUR DEPOISSON "EXPLORATOR," by J. Fontaine, Compagnie générale de télégraphie Sans Fil (CSF), Paris, France.

A COMPREHENSIVE ECHO SOUNDER FOR DISTANT-WATER TRAWLERS, by G. H. Ellis, P. R. Hopkin and R. W. G. Haslett, Kelvin Hughes Division of S. Smith & Sons (England) Ltd., London, England.

ECHO-SOUNDING THROUGH ICE, by Tomiju Hashimoto, and Yoshinobu Maniwa, both of Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan; and Osamu Omoto, and Hidekuni Noda, both of Shibaura Technical Institute, Tokyo, Japan.

FREQUENCY ANALYSIS OF MARINE SOUNDS, by Tomiju Hashimoto and Yoshinobu Maniwa, Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

ECHO DETECTION OF TUNA, by Minoru Nishimura, Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

SECTOR-SCANNING SONAR FOR FISHERIES PURPOSES, by D. G. Tucker and V. G. Welsby, both of The University of Birmingham, Birmingham, England.

IDENTIFYING PACIFIC COAST FISHES FROM ECHO-SOUNDER RECORDINGS, by E. A. Best, Marine Resources Branch, California Department of Fish and Game, Menlo Park, California, U.S.A.

DETECTION ET LOCALISATION DES BANCS DE POISSONS, by Robert Lenier, President du Syndicat de materiél professionel des Industries Electroniques et Radio-Electriques, Conseiller des Pêches Maritimes, Courbevoie (Seine), France.

A NEW SONAR SYSTEM FOR MARINE RESEARCH PURPOSES, by T. S. Gerhardsen, Simonsen & Mustad A.A., Horten, Norway.

STUDY OF ACOUSTICAL CHARACTERISTICS OF FISH, by E. V. Shishkova, Institue of Marine Fisheries and Oceanography (VNIRO), Moscow, U.S.S.R.

BIO-ACOUSTICAL DETECTION OF FISH-POSSIBILITIES AND FUTURE ASPECTS, by G. Freytag, Institut für Netz- und Materialforschung, Hamburg-Altona 1, Federal Republic of Germany.

Topic: Fleet Operations

MOTHERSHIP FISHING FOR CRAB, by Nippon Suisan Kaisha, Ltd., Tokyo Building, Marunouchi, Chiyoda-ku, Tokyo, Japan.

TUNA LONGLINE MOTHERSHIP FLEET OPERATIONS, by Goro Okabe, Taiyo Gyogyo Kabushiki Kaisha, 4, 1-Chome, Marunouchi, Chiyoda-ku, Tokyo, Japan.

LAS PESQUERIAS ESPAÑOLAS AUSTRO-ATLAÑTICAS, by V. Paz-Andrade, Unión Española de Armadores Pesqueros, Vigo, España.

Subject: GEAR RESEARCH

Topic: Mechanical and Hydro-Dynamic Theory

THE THEORY OF DESIGNING FISHING NETS AND TESTING THEM IN MODEL, by Tasae Kawakami, Department of Fisheries, Kyoto University, Maizuru, Japan.

FISHING METHODS AND GEAR RESEARCH INSTITUTES: THEIR ORGANIZATION AND SCOPE, by A. von Brandt, Institut für Netz- und Materialforschung, Hamburg, Federal Republic of Germany.

THE DEVELOPMENT OF A MIDWATER TRAWL, by P. Dale, Arbeidsutvalget for utvikling av Pelagisk embåtstrål (APE), Bergen, Norway, and S. Moller, Director, R & D Section, A. S. Bergens Mekaniske Verksteder, Bergen, Norway.

Topic: Instrumented Gear Testing

SOME JAPANESE INSTRUMENTS FOR MEASURING FISHING GEAR PERFORMANCE, by Chikamasa Hamuro and Kenji Ishii, both of Fishing Boat Laboratory, Fisheries Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

TRAWL STUDIES AND CURRENTS, by J. N. Carruthers, National Institute of Oceanography, Godalming, Surrey, England.

PERFORMANCE OF THE GRANTON TRAWL, by W. Dickson, Department of Agriculture and Fisheries for Scotland, Marine Laboratory, Torry, Aberdeen, Scotland.

TRAWL GEAR INSTRUMENTATION AND FULL-SCALE TESTING, by J. Nicholls, Westland Aircraft Ltd., Saunders-Roe Division, Isle of Wight, England.

Topic: Fish Behavior Studies

SHRIMP BEHAVIOR AS RELATED TO GEAR RESEARCH AND DEVELOPMENT, by Charles M. Fuss, Jr., U. S. Bureau of Commercial Fisheries, Gear Research Station, Panama City, Florida, U.S.A.

TUNA BEHAVIOR RESEARCH PROGRAM AT HONOLULU, by John J. Magnuson, U. S. Department of the Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Honolulu, Hawaii.

EVOLUTION DE LA PÊCHE À LA LUMIERE DANS LES LACS AFRICAINS, by A. Collart, FAO/EPTA Economiste des Pêches, Cotonou, Dahomey.

UTILIZATION OF FISH REACTIONS TO ELECTRICITY IN COMMERCIAL SEA FISHING, by Conradin O. Kreutzer, Smith Research and Development Co., Inc., Lewes, Delaware, U.S.A.

THE USE OF AIR-BUBBLE CURTAINS AS AN AID TO FISHING, by Keith A. Smith, U. S. Bureau of Commercial Fisheries, Gloucester, Massachusetts, U.S.A.

AN EXPERIMENT ON THE DISPERSION OF CHUM, by Kentaro Hamashima, Nagasaki Prefectural Fishing Experimental Station, Nagasaki, Japan.

PROBLEMS OF ELECTRO-FISHING AND THEIR SOLUTIONS, by Jurgen Dethloff, Intelectron International Electronics GmbH, Hamburg, Federal Republic of Germany.

THE IMPORTANCE OF VISION IN THE REACTION OF FISH TO DRIFTNETS AND TRAWLS, by J. H. Blaxter, B.B. Parrish and W. Dickson, all of Department of Agriculture and Fisheries for Scotland, Marine Laboratory, Torry, Aberdeen, Scotland.

THE IMPORTANCE OF MECHANICAL STIMULI IN FISH BEHAVIOR, ESPECIALLY TO TRAWLS, by C. J. Chapman, Department of Agriculture and Fisheries for Scotland, Marine Laboratory, Torry, Aberdeen, Scotland.

PUMP FISHING FOR SAURY WITH LIGHT AND ELECTRIC CURRENT ATTRACTION, by I, V. Nikonorov, Institute of Marine Fisheries and Oceanography (VNIRO), Moscow, U.S.S.R.

Topic: Application to Fisheries of Recent Advances in Telemetry, Computer Science, etc.

PROSPECTIVE DEVELOPMENTS IN THE HARVEST OF MARINE FISHES, by Dayton L. Alverson, U. S. Bureau of Commercial Fisheries, Exploratory Fishing and Gear Research Base, Seattle, Washington, U.S.A., and Norman J. Wilimovsky, Institute of Fisheries, University of British Columbia, Vancouver, British Columbia, Canada.

AUTOMATIC DATA PROCESSING AND COMPUTER APPLICATION TO FISHERIES, by Benjamin F. Leeper, Univac Division of Sperry-Rand Corp., Baton Rouge, Louisiana, U.S.A.

MARYLAND PAN-FRIED OYSTERS

The home economists of the Bureau of Commercial Fisheries, Fish and Wildlife Service, U. S. Department of the Interior, recommend Maryland pan-fried oysters as a special treat for the family for their eating enjoyment.

2 cans (12 ounces each) fresh shucked oysters
2 eggs, beaten
2 tablespoons milk
1 teaspoon salt
Dash pepper
1½ cups dry bread crumbs
1½ cups flour
Lemon wedges
Tartar Sauce

QUICK TARTAR SAUCE

1 cup mayonnaise or salad dressing
½ cup undrained sweet pickle relish

Combine mayonnaise and relish; mix thoroughly. Chill.

Drain oysters. Combine egg, milk, and seasonings. Combine crumbs and flour. Roll oysters in crumb mixture. Dip in egg mixture and roll in crumb mixture. (A commercial breading may be used. Follow directions on the package.) Fry in hot fat at moderate heat until brown on one side. Turn carefully and brown the other side. Cooking time approximately 5 minutes. Drain on absorbent paper. Serve with lemon wedges and tartar sauce. Serves 6.

Alaska

SOVIET TRAWLERS RETURN TO GULF OF ALASKA:

In mid-March 1964, a fleet of Soviet trawlers and accompanying processing and support vessels were seen about 40 miles southwest of Yakutat, Alaska. That was the first observed appearance during 1964 of Soviet fishing vessels in the Gulf of Alaska. The fleet was probably trawling for Pacific Ocean perch, large concentrations of which were located off the Yakutat Bay area by Soviet exploratory fishing vessels in 1960 and 1961.

Although the sighting revealed a small fleet of less than 20 vessels, their appearance so far east may indicate an expansion of Soviet fisheries in the Gulf of Alaska in 1964. Large-scale Soviet fishing in the Gulf of Alaska began in 1962 and has been largely centered around the Kodiak Island area. The Soviets usually leave the Gulf of Alaska about the end of October apparently to avoid the severe winter storms.

* * * * *

BRISTOL BAY RED SALMON RUN FORECAST FOR 1964:

The Bristol Bay red salmon run will number approximately 19.3 million fish, according to an announcement in February by the Commissioner of the Alaska Department of Fish and Game. The forecast is based on a joint analysis of the available information by scientists of the Alaska Department of Fish and Game, the U. S. Bureau of Commercial Fisheries, and the Fisheries Research Institute.

Of the 19.3-million fish forecast, only about 8 or 9 million are expected to be available to United States fishermen, as out of the total run must come the necessary escapement plus the high-seas catch by the Japanese.

* * * * *

FOREIGN FISHING FLEETS IN BERING SEA INCREASE IN FEBRUARY:

The Soviet fleets fishing in the eastern Bering Sea, mainly northwest of the Pribilof Islands, continued to build up throughout February. Japanese fishing activities, however, remained at a low level.

More than 150 Soviet trawlers and associated support vessels were believed to be fishing in the Bering Sea in February. Major fishing emphasis was reportedly on herring and, to a lesser degree, flatfish and rockfish.

The Japanese shrimp factoryship Chichibu Maru and her accompanying trawlers returned to Japan in late December 1963 for a brief refit and were back fishing in the area north of Unimak Island in the Bering Sea by early February. Two stern trawlers of the Akebono Maru type were reported fishing in the same vicinity.

* * * * *

MARINE PLANTS AND ANIMALS IN SHALLOW COASTAL WATERS NEAR SITKA:

The shallow coastal waters near Sitka, Alaska, were studied for a one-week period this March by a team of diver-biologists from the U. S. Bureau of Commercial Fisheries Biological Laboratory at Auke Bay, Alaska. The major objective of the Sitka expedition was to obtain scientific information on marine plants and animals inhabiting open coast situations. In the past, study of that area has been limited to collecting from tide pools and fishing or dredging in deeper waters. Those methods are now regarded as quite crude and relatively unproductive. With the use of SCUBA equipment, diving biologists now can intensively observe, measure, and collect in regions below the tides.

The Bureau's scientific group was met at the Sitka State Ferry Terminal by members of the Alaska Department of Fish and Game who provided transportation for the divers to

and from the Bureau's oceanographic research vessel, the Murre II, which served as a base of operations for the expedition. From Sitka, the Murre II proceeded to nearby coastal points in the vicinity of Samsing Cove and Pirate Cove. The divers made both day and night dives at those areas to count, collect, and photograph the rich marine animal and plant life there.

Fish collections on this expedition contained 25 species, 5 of which have never been recorded before in Alaskan waters. These northward range extensions represent fish previously known only as far north as the Queen Charlotte Islands in British Columbia. Biologists made density estimates of fish populations by swimming transects and recording the numbers and kinds of fish sighted along the transect line.

Some of the divers counted octopus and obtained specimens for the Bureau's laboratory collection while other members of the expedition conducted a study of the subtidal distribution and density of the Sitka abalone. Collections were also made of other common and rare invertebrate species including sea stars, sea cucumbers and sea urchins.

Alaska Fisheries Exploration and Gear Research

TRAWLING EXPERIMENTS YIELD HEAVY SHRIMP CATCHES:

Experimental drags with a 10-foot trynet produced heavy catches of shrimp near Kasitsna Bay during early February. Drags of 15 minutes each yielded shrimp catches of 160 pounds. The pot-fishing gear for adult shrimp studies was changed from conventional bottom sets to sets of vertical strings so as to obtain information on vertical distribution of the shrimp.

American Samoa

JAPANESE GOVERNMENT ISSUES SPECIAL PERMIT TO LAND FIJI ISLANDS TUNA AT SAMOA:

The Japanese Fisheries Agency has issued a special permit (valid until June 1964) authorizing the landing at American Samoa of tuna caught by Japanese tuna vessels (about 17) assigned to the base at Levuka, Fiji Islands. Reportedly, base facilities at Levuka are not expected to be completed until June. Also, one of the United States firms located at American Samoa is said to be faced with the problem of procuring an adequate supply of tuna due to the reluctance of Japanese tuna vessel operators to fish out of American Samoa since fishing in waters adjacent to that Island is poor. (Nihon Suisan Shimbun, Feb. 17; Suisancho Nippo, Feb. 5, 1964.)

California

SEA OTTER POPULATION SURVEY CONTINUED:

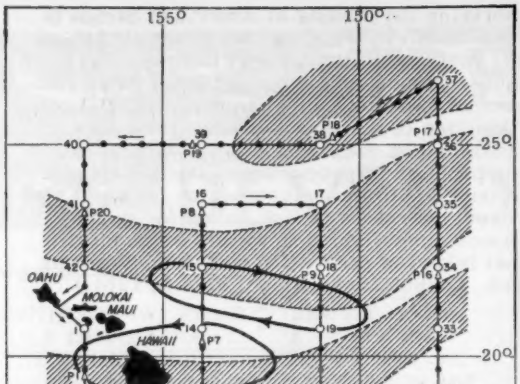
Airplane Spotting Flight 64-4-Special Project (February 13, 1964): To obtain a visual and photographic count of California sea otters (Enhydra lutris nereis), the California coastline from Morro Bay to Monterey was flown on the morning of February 13, 1964, by the California Department of Fish and Game's Beechcraft N5614D. Turbulent air necessitated flying at an altitude of about 250 feet, but visability was excellent. One observer counted 339 sea otters, and another observer counted 351 sea otters in the area surveyed during the flight. The largest concentrations of sea otters were in the Carmel Bay area just below Cape San Martin.

Note: See Commercial Fisheries Review, April 1964 p. 12.

Central Pacific Fisheries Investigations

NEW FISHERIES-OCEANOGRAPHIC RESEARCH VESSEL COMPLETES SUCCESSFUL MAIDEN VOYAGE:

M/V "Townsend Cromwell" Cruise 1 (February 14-March 6, 1964): The first scientific cruise of the Townsend Cromwell, the new fisheries-oceanographic research vessel operated by the Honolulu Biological Laboratory of the U.S. Bureau of Commercial Fisheries, was a success, announced the Bureau's Hawaii Acting Director on March 10, 1964. The vessel's three-week maiden voyage began on February 14, 1964, and was completed on March 6 when she returned to her base at Kewalo Basin, Honolulu, Hawaii. During the



Shows cruise track of research vessel Townsend Cromwell, February 14-March 6, 1964.

cruise she met with almost constant strong winds and rough seas.

The vessel cruised 4,500 miles and occupied its scheduled 42 oceanographic stations, sampling water temperatures and water chemistry down to depths of 4,500 feet throughout an area of 380,000 square miles to the east of the Hawaiian Islands. Detailed observations of weather were also recorded, and hauls were made with fine-meshed plankton nets to collect samples of the newly hatched larvae of skipjack (aku) tuna and other tuna species.

The first research cruise of the Townsend Cromwell also marked the initiation of a new large-scale investigation of the trade wind zone waters around the Hawaiian Islands. According to the oceanographer in charge of the cruise, the trade winds are the most important wind system of the North Pacific Ocean, for they drive the ocean currents that carry warm water to the north and cool water to the equatorial region, thereby moderating the climates of western America and eastern Asia. The projected study will contribute to scientists' understanding of the mechanism by which the trade winds move the ocean's waters and will eventually improve the accuracy of forecasting of climatic trends in the sea and over the land. The trade winds are of direct importance to Hawaii's major fishery, for their strength and steadiness determine the type of water which the currents bring to bathe the Islands. This in turn determines whether fishing will be good or poor during the summer skipjack fishing season.

During this cruise, a standard watch for bird flocks and fish schools was maintained during daylight hours. Only scattered birds were seen throughout the cruise except east of Hawaii along 154° W. and north of the Islands along 157° W. where bird flocks were observed.

Note: See Commercial Fisheries Review, March 1964 p. 32.

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PLANKTON STUDIES GIVE CLUES TO INDIAN OCEAN-ATLANTIC ZOOGEOGRAPHICAL RELATIONS:

Problems in the zoogeography of marine animals--their large-scale distribution in relation to geographic features--are interesting in themselves and of practical importance in several ways. The solution of such problems for example, may reveal the boundaries of resources of commercially-valuable fish, and thus contribute to the intelligent planning of fishery management measures. Zoogeographical studies can also lead to a better understanding of the biology of small animals that are important in the food chains of the larger creatures which man directly utilizes. When it comes to the zoogeography of planktonic animals, which have little or no power to move except as the currents carry them, study of the distribution of species provides valuable indications of the patterns of oceanic water circulation.

Recently, a marine biologist specializing in that type of "indicator organism" research

at the Biological Laboratory of the U. S. Bureau of Commercial Fisheries in Honolulu, Hawaii, discovered in his samples of small planktonic crustaceans evidence of a remarkably broad separation between certain animal populations of the equatorial Atlantic and the Indian Ocean. The biologist's studies are primarily concentrated on the copepods, which are small and somewhat shrimplike animals, individually well under an inch in length, but in the aggregate bulking very large in the economy of the sea and the food chains of most oceanic fishes. The biologist had earlier found that certain species of one family of copepods, the Candaciidae, in the central Pacific Ocean showed quite distinct patterns of occurrence, coinciding with the major patterns of circulation of the ocean waters.

Participation of the Bureau's Honolulu Biological Laboratory staff in the International Indian Ocean Expedition is providing an opportunity to discover whether similar copepod-ocean current relations are to be found in other parts of the world's oceans. United States research vessels, in the course of their 1963-64 schedule of biological field work, will collect more than two thousand samples of Indian Ocean plankton. Study of the copepods in those collections is already under way, and it appears from the preliminary findings that in the Indian Ocean, as in the Pacific, certain species of the family Candaciidae are associated with waters of certain temperature and salinity characteristics. For example, the distributions of some copepods are associated with water of the type found primarily in the Arabian Sea, while others are indicators of the equatorial water or the south-central water of the Indian Ocean.

It is known that water from the equatorial regions of the Indian Ocean flows south along the southeast coast of Africa as the Agulhas Current. During the southern summers this current may extend around the Cape of Good Hope to the South Atlantic, and thus afford a possible avenue for equatorial Indo-Pacific plankton animals to reach the Atlantic and mingle there with their counterparts in the Atlantic plankton. It has not been known, however, how far west the influence of the Agulhas Current reaches, nor consequently whether mixing of the equatorial Indian Ocean and Atlantic faunas actually occurs.

The Bureau's laboratory planktologist has found, by examining the candaciid copepods in collections taken around the coasts of South Africa by the research ship Vema of the Lamont Geological Observatory, Columbia University, that the transport of Indo-Pacific equatorial plankton into the Atlantic appears to be small. Although copepods typical of the tropical Indian Ocean were common in the Agulhas Current off the southeastern coast of Africa, they faded out of the samples before the Cape of Good Hope was reached. A conjecture was that the few animals which may reach the southern tip of Africa either are carried by the currents onto shallow coastal banks and die of inshore conditions to which they are not adapted or are turned back eastward by encountering the West Wind Drift. If any survived those obstacles and passed the Cape, they would then fall in with the cold, upwelled waters of the Benguela Current, extending 200 to 300 miles offshore along the southwestern coast. This cold current was found to be heavily populated by Antarctic and inshore species of plankton.

The copepod species used by the biologist as indicators of equatorial Indian Ocean water did not turn up in Atlantic collections any farther south than the Gulf of Guinea, which meant that more than 1,500 miles separated the Indian Ocean and Atlantic populations. This distance implies a genetic isolation that might be expected to result in anatomical differences between specimens of the same species from the two oceans. A search for such differences is now being made and, if found, they will support the hypothesis of independent plankton populations in the Indian Ocean and the equatorial Atlantic.

Exports

SHRIMP VESSEL EQUIPMENT SOLD TO COLOMBIA FIRM BY UNITED STATES COMPANY:

A company in Savannah, Ga., has arranged to sell shrimp vessel equipment to a firm in Colombia. The transaction with the South American firm involves several hundred thousand dollars. Export insurance for the contract was provided by the U. S. Export-Import Bank in the form of a 4-year credit guarantee, which was negotiated with the assistance of the Savannah Regional Export

Expansion Committee of the U. S. Department of Commerce. (International Commerce, March 2, 1964.)

Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-FEBRUARY 1964:

Fresh and Frozen: For the use of the Armed Forces under the Department of Defense, more fresh and frozen fishery products were purchased by the Defense Subsistence Supply Centers in January 1964 than in the previous month. The increase was 25.6 percent in quantity and 21.7 percent in value. Compared with the same month in the previous year, purchases in January 1964 were up 0.9 percent in quantity but down 29.6 percent in value. The purchases in January 1963 had the exceptionally high average value of 74.0 cents per pound due to large purchases of shrimp.

Purchases in February 1964 were up 17.1 percent in quantity and 15.3 percent in value from those in the same month in 1963.

Total purchases in the first 2 months of 1964 were up 8.8 percent in quantity but down 11.3 percent in value from those in the same period of the previous year. In 1964, there were larger purchases of flounder fillets, ocean perch fillets, and oysters, but smaller purchases of shrimp, haddock fillets, sole fillets, and halibut steaks. In addition, the average wholesale price of shrimp in early 1964 was down sharply from the levels maintained in January-February 1963.

Table 1 - Fresh and Frozen Fishery Products Purchased by Defense Subsistence Supply Centers, January-February 1964 with Comparisons

QUANTITY						VALUE					
January		February		Jan.-Feb.		January		February		Jan.-Feb.	
1964	1963	1964	1963	1964	1963	1964	1963	1964	1963	1964	1963
(1,000 Lbs.)						($1,000)					
2,108	2,089	2,300	1,964	4,408	4,053	1,088	1,546	1,231	1,068	2,319	2,614

Table 2 - Selected Purchases of Fresh and Frozen Fishery Products by Defense Subsistence Supply Centers, January-February 1964 with Comparisons

Product		January		February		Jan.-Feb.	
		1964	1963	1964	1963	1964	1963
		(Pounds)					
Shrimp:	raw headless	83,500	2/	99,400	2/	182,900	2/
	peeled and deveined	73,850	2/	110,900	2/	184,750	2/
	breaded	288,800	2/	349,200	2/	638,000	2/
Total shrimp		446,150	737,817	559,500	394,526	1,005,650	1,132,343
Scallops		172,750	154,800	218,350	245,000	391,100	399,800
Oysters:	Eastern	99,954	2/	105,434	2/	205,388	2/
	Pacific	30,200	2/	21,930	2/	52,130	2/
Total oysters		130,154	102,474	127,364	90,973	257,518	193,447
Clams		37,448	26,570	39,060	44,386	76,508	70,956
Fillets:	Cod	33,196	23,944	71,350	93,294	104,546	117,238
	Flounder	529,744	292,200	328,072	285,920	857,816	578,120
	Haddock	1/138,594	261,880	3/221,650	233,040	4/360,244	494,920
	Ocean Perch	276,000	225,240	386,600	323,092	662,600	548,332
	Sole	-	70,430	-	31,502	-	101,932
Steaks:	Halibut	106,525	102,605	88,000	147,515	194,525	250,120
	Salmon	13,157	7,250	10,410	26,880	23,567	34,130
	Swordfish	800	1,250	1,900	1,800	2,700	3,050

1/Includes 8,000 pounds of haddock portions.
2/Breakdown not available.
3/Includes 650 pounds of haddock portions.
4/Includes 8,650 pounds of haddock portions.

Table 3 - Canned Fishery Products Purchased by Defense Subsistence Supply Centers, January-February 1964 with Comparisons

Product	QUANTITY						VALUE					
	January		February		Jan.-Feb.		January		February		Jan.-Feb.	
	1964	1963	1964	1963	1964	1963	1964	1963	1964	1963	1964	1963
	(1,000 Lbs.)						($1,000)					
Tuna	650	-	278	10	928	10	285	-	123	6	408	6
Salmon	679	3	1/	3	679	6	416	2	2/	2	416	4
Sardines	20	37	40	57	60	94	8	15	14	24	22	39

1/Less than 500 pounds.
2/Less than $500.

Canned: In the first 2 months of 1964, there were substantial purchases of canned tuna, canned salmon, and canned sardines for the use of the Armed Forces. Of the 3 principal canned fishery products (tuna, salmon, and sardines), only sardines were purchased in sizable quantity in January-February 1963.

Notes: (1) Armed Forces installations generally make some local purchases not included in the data given; actual local purchases are higher than indicated because local purchases are not obtainable.
(2) See Commercial Fisheries Review, April 1964 p. 14.

Fishy Flavors and Odors

CHEMISTRY OF VOLATILE COMPONENTS IN FISHERY PRODUCTS STUDIED:

The most reliable procedures now being used for determining the quality of fish and fishery products are dependent upon organoleptic evaluations (smell, taste, appearance). Such examinations give only a superficial quality indication depending entirely on the subjective judgment of the examiner. For most purposes this method is satisfactory but it provides no information regarding the chemical reactions that produce undesirable flavors and odors in fish. The mechanism of flavor and odor development is extremely complex. An understanding of the fundamental spoilage reactions is essential to reduce the development of undesirable fish odors and flavors and improve product quality.

Studies on the chemistry of the volatile odor and flavor components in raw and cooked haddock fillets and clam meats are being conducted by the U. S. Bureau of Commercial Fisheries Technological Laboratory at Gloucester, Mass. Some of the necessary preliminary planning for the project included the purchase and construction of specialized equipment for handling extremely small quantities of very volatile compounds. Precise sampling techniques had to be developed to handle and transfer those small quantities for analysis.

Most of the compounds in the flavor and odor components of fishery products are made up of sulfides, carbonyls, and amines. Techniques for identifying the sulfides and carbonyls from flavor and odor mixtures are being investigated in an effort to relate concentrations of those compounds to fish quality. Investigations using gas chromatography have been successful in identifying several sulfide compounds (dimethylsulfide, hydrogen sulfide, and dimethyldisulfide). Colorimetric methods for total sulfide and infrared spectrophotometry for compound identification are also being investigated. Through the use of wet chemistry in conjunction with gas chromatography, volatile carbonyl compounds in clam meats have been separated. A method which permits concentration of the carbonyls using the Girard-T reagent, use of a regeneration process, and subsequent introduction into the gas chromatograph, has resulted in the detection of at least 18 carbonyl compounds in clam meats. Prior to development of this procedure, a maximum of 8 carbonyls had been detected.

Future investigations will include the identification of carbonyl compounds by mass spectrometry, investigation and identification of amines, and the investigation of odor and flavor components of other fish such as cod, pollock, and ocean perch. Also, studies will be made to determine how the odor and flavor components can be controlled or altered to increase the quality and storage life of fishery products.

Great Lakes

MIDWEST FEDERATED FISHERIES COUNCIL ORGANIZED:

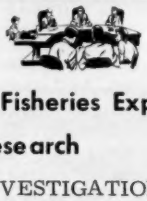
The Midwest Federated Fisheries Council, an organization of existing fisheries associations in the Middle West, has been incorporated to give better representation to the fishing industry in the Great Lakes and midwestern

rivers region, and to coordinate the promotion of fishery products by the individual organizations. The Council was formed through the combined efforts of representatives of the commercial fishermen, wholesalers, brokers, processors, and large retailers.

The first objective of the Council is to seek legislation in Congress that will bring some stability to the fresh-water fisheries. All segments of the industry from the producers to the retailers have suffered in recent years because of the depredation of the sea lamprey, and unexpected marketing problems.

The affairs of the Council will be governed by a Board of Directors made up of two representatives from each of the six incorporating organizations. Provisions have been made to accept additional organizations and to provide representation on the Board of Directors. The six incorporating organizations establishing the Council are: The Seafood Club of Chicago, Michigan Fish Producers Association, Ohio Commercial Fishermen's Association, Minnesota Fisheries Council, Wisconsin Fisheries Council, and the Fisheries Council of the Great Lakes.

A meeting was planned in Chicago, Ill., early in April 1964 to complete the organization of the Council and to outline in more detail the immediate objectives.



Great Lakes Fisheries Exploration and Gear Research

TRAWLING INVESTIGATIONS IN SOUTHERN LAKE MICHIGAN:

M/V "Kaho" Cruise 15 (Phase I--December 16-20, 1963; Phase II--January 28-February 6, 1964; Phase III--March 3-12, 1964): Investigations to determine the effects of environmental conditions on distribution of fish,

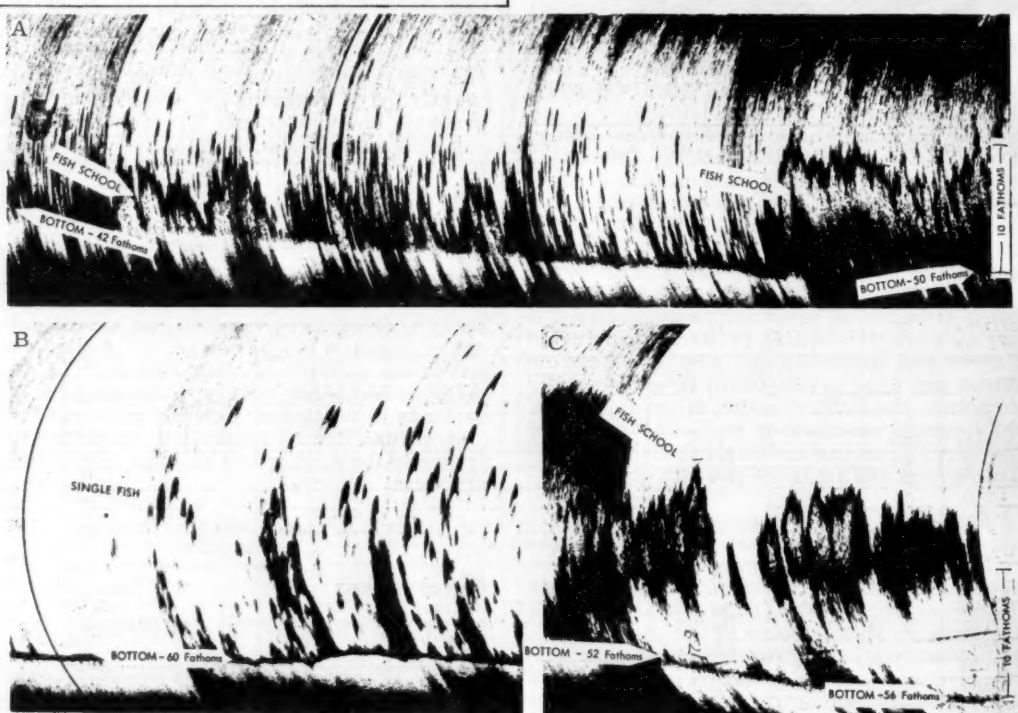


Fig. 1 - Echograms from a high resolution echo-sounder showing concentrations of fish on bottom and at midwater levels in southern Lake Michigan during M/V Kaho Cruise 15. A - Distribution of fish from 42 to 50 fathoms; distance traveled is 5 nautical miles at 9 knots. B - Vertical dispersion of fish at midwater levels; distance traveled is 1.5 nautical miles at 2.5 knots. C - Midwater concentrations of fish; distance traveled is 1.1 nautical miles at 9 knots.

availability to bottom trawls, and performance of bottom trawls were conducted by the U. S. Bureau of Commercial Fisheries exploratory fishing and gear research vessel Kaho in southern Lake Michigan during a three-phase cruise--December 16-20, 1963, January 28-February 6, and March 3-12, 1964. The primary objective was to study trawl performance as affected by the direction of towing in relation to water currents. The secondary objective was to obtain additional information on the seasonal effectiveness of trawls at previously established stations in southern Lake Michigan.

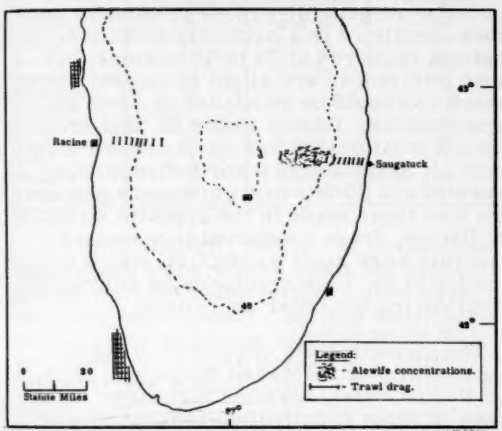


Fig. 2 - Shows area of operations in Lake Michigan by M/V Kaho during Cruise 15 (December 16, 1963-March 12, 1964).

The cruise was highlighted during Phases II and III by the location of unusually high concentrations of alewife between 35 and 60 fathoms off Saugatuck, Mich. (fig. 1). Local commercial trawlers, following up on the information, have enjoyed productive fishing never before experienced at those depths and that time of year. During February 6-March 19, 1964, three commercial fishing vessels landed about 428,000 pounds and averaged some 9,400 pounds per hour of fishing effort.

During past explorations, large deviations in catch rate between drags made in alternating north and south direction have been noted. The results of recent limnological surveys indicate that currents in the south basin of Lake Michigan are dependent upon prevailing wind conditions which cause water currents to exceed one knot for many hours on occasion and may be either clockwise or counter-clockwise. Although other factors influence the catch rate, consistent large fluctuations make it reasonable to believe that catch rates are affected by those currents. Information regarding the influence from lake current may enable commercial trawl fishermen to account for large discrepancies in individual trawl catches.

Table 1 - Summary of Catch Rate, Species Composition, and Percentage Differential by Direction of Trawl Drag Taken off Saugatuck, Mich., during Kaho's Exploratory Cruise 15, December 16-20, 1963; January 28-February 6, 1964; and March 3-12, 1964

Date	Depth	North Drag				South Drag				Percentage Increase or Decrease South to North
		Alewife	Chub	Others	Total	Alewife	Chub	Others	Total	
12/17/63	17	120	15	10	145	860	34	26	920	↑534.4
12/17/63	17	150	9	1	160	445	14	21	480	↑200.0
1/30/64	5	-	-	30	30	-	-	65	65	↑116.6
1/30/64	10	-	-	100	100	-	-	120	120	↑ 20.0
1/30/64	15	-	-	240	240	-	-	340	340	↑ 41.6
1/30/64	20	-	16	24	40	-	14	21	35	- 14.2
1/30/64	25	-	128	2	130	-	203	7	210	↑ 61.5
1/31/64	30	15	254	6	275	45	215	-	260	- 5.8
2/3/64	35	3,000	30	-	3,030	3,400	25	-	3,425	↑ 13.0
2/3/64	40	2,400	60	-	2,460	No Effort				
3/10/64	10	-	-	55	55	-	-	42	42	- 30.9
3/10/64	15	10	2	73	85	5	-	75	80	- 6.3
3/3/64	20	1	20	14	35	1	20	14	35	0.0
3/3/64	25	1	186	28	215	1	140	14	155	- 38.7
3/3/64	30	5	200	15	220	2	80	3	85	-158.8
3/3/64	35	650	110	5	765	500	80	5	585	- 30.8
3/3/64	40	400	80	5	485	80	55	5	140	-246.4
3/4/64	45	1,900	100	-	2,000	1,000	114	6	1,120	- 78.6
3/4/64	50	1,300	100	-	1,400	1,100	100	-	1,200	- 16.7
3/4/64	60	300	100	-	400	700	110	5	815	↑103.7
3/6/64	70	510	80	10	600	No Effort				
3/11/64	80	140	35	95	270	No Effort				

Although the study of the effects of lake currents was the primary consideration this cruise, other information and samples of fish were collected as follows: (1) differential in east-west seasonal abundance and distribution of alewife and chubs, (2) availability of all species to bottom trawls, (3) seasonal length-frequency data of alewife and chubs to supplement material collected earlier for biological research, (4) collection of fish, water, and bottom samples for subsequent laboratory analysis in connection with botulism studies, and (5) collection of fish samples from various depths between 5 and 50 fathoms for life history studies.

Excellent exploratory catches of alewife were taken at 20 fathoms during Phase I, at 35 and 40 fathoms during Phase II, and at 40 to 60 fathoms during Phase III, but only along the east shore. Fair catches of chubs were taken at 15 fathoms off Saugatuck during Phase II and at 25 and 30 fathoms during Phase III. Best catches of chubs were obtained off Racine, Wis., during Phase III at 30 to 50 fathoms.

FISHING OPERATIONS: A total of 60 trawl drags was completed with a 52-foot (headrope) fish trawl during 13 days of operation--43 drags were completed off Saugatuck from 5 to 80 fathoms and 17 were made from 15 to 60 fathoms off Racine. All drags except 4 were paired tows of 30 minutes' duration and made in alternating north and south directions. Adequate warp length versus depth was employed to insure good bottom contact; and shaft r.p.m. remained constant. No gear damage was sustained during the cruise. Bottom topography and bathymetric distribution of fish were continuously recorded with a high resolution type depth recorder.

FISHING RESULTS: The study revealed that the direction of drag in relation to the observed current may consistently increase or decrease the catch by over 50 percent (tables 1 and 2). During Phases I and II, trawl drags made off Saugatuck in a south course were generally more productive than those completed in a northerly direction. Exceptions occurred at 20 to 30 fathoms, but those differences are slight in comparison to others and could be attributed to other gear inconstancies. During Phase III, this drag-current relationship was reversed and tows made off Saugatuck in a north direction between 10 and 50 fathoms were more productive than those made in the opposite direction. Off Racine, drags completed in a southerly direction were more productive, which is indicative of the counter-clockwise current in effect during the latter operations.

The investigations completed along the lakewide transect between Saugatuck, Mich., and Racine, Wis., revealed significant differences in depth distribution, abundance, and species interrelationship from one side of the lake to the other. The most outstanding features were the almost total absence of alewife from catches off Racine and the extremely large concentrations of that species off Saugatuck. The alewife dominated catches in that area at 17 fathoms during Phase I and from 35 to 80 fathoms during Phases II and III.

Table 2 - Summary of Catch Rate, Species Composition, and Percentage Differential by Direction of Trawl Drag Taken off Racine, Wisconsin, during Kaho's Exploratory Cruise 15, March 3-12, 1964

Date	Depth	North Drag				South Drag				Percentage Increase or Decrease South to North
		Alewife	Chub	Others	Total	Alewife	Chub	Others	Total	
3/7/64	15	-	5	15	20	-	10	20	30	↗50.0
3/7/64	20	-	12	8	20	-	7	13	20	0.0
3/7/64	25	-	50	10	60	2	80	13	95	↗58.3
3/7/64	30	-	195	5	200	-	200	5	205	↗ 2.5
3/7/64	35	3	295	2	300	-	425	5	430	↗43.3
3/7/64	40	1	108	1	110	1	188	1	190	↗72.7
3/8/64	45	5	165	5	175	5	310	5	320	↗82.8
3/8/64	50	20	245	10	275	10	400	10	420	↗52.7
3/9/64	60	1	79	20	100	No Effort				

Chub catches were good (300-425 pounds per half-hour drag) off Racine at 35 to 50 fathoms but only fair (200-250 pounds per half-hour drag) off Saugatuck at 25 and 30 fathoms. Only one catch contained another species in significant quantity, and that was 319 pounds of yellow perch at 15 fathoms off Saugatuck.

Table 3 - Other Species Taken in Lake Michigan by M/V Kaho

Species	No. of Drags Yielding	Pounds/Drag	Combined Catch (Pounds)
Herring	19	2 to 35	169
Sculpin	43	1 to 94	233
Smelt	24	1 to 10	79
Spottail shiner	19	1 to 10	47
Stickleback	3	1	3
Sturgeon	1	5	5
Sucker	3	2 to 7	16
Trout-perch	20	1 to 3	26
Trout	1	2	2
Whitefish	7	1 to 7	18
Yellow perch	22	1 to 319	958

HYDROGRAPHIC DATA: Bathythermograph casts were made at each station, and air and surface water temperatures were recorded continuously. Surface water temperatures ranged from 32.0° to 36.0° F. throughout the cruise period, and bottom temperatures ranged from 36.0° to 40.0° F.

M/V "Kaho" Cruise 16 (March 31-April 9, 1964): To extend knowledge on the seasonal distribution, abundance, and availability of the alewife and chub stocks in central and southern Lake Michigan to bottom trawls was to be the primary objective of this 10-day cruise by exploratory fishing and gear research vessel Kaho.

Gulf Exploratory Fishery Program

SHRIMP AND MENHADEN INVESTIGATIONS IN THE GULF OF MEXICO CONTINUED:

M/V "Oregon" Cruise 90 (February 17-March 13, 1964): The main objectives of this 26-day cruise along the Louisiana coast by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Oregon were to: (1) obtain comparative data on the seasonal availability of brown shrimp (Penaeus aztecus), pink shrimp (P. duorarum), white shrimp (P. setiferus), and royal-red shrimp (Hymenopenaeus robustus); (2) investigate off-season menhaden resources; and (3) conduct deep-water faunal trawling transects in the northern area of the Gulf of Mexico.

Catches of white and brown shrimp were light and scattered, with most counts (heads-off) in the 21-25 and 26-30 ranges. Very few pink shrimp were taken. White shrimp were found in 6 to 20 fathoms and brown shrimp in 16 to 52 fathoms.

Royal-red shrimp were caught in light numbers between 220 and 300 fathoms, with drags in 220 to 230 fathoms yielding the best results. The largest catch of royal-red shrimp in a single 2-hour tow amounted to 26 pounds (heads-on). Heavy seas and rough bottom were encountered during much of the deep-water trawling.

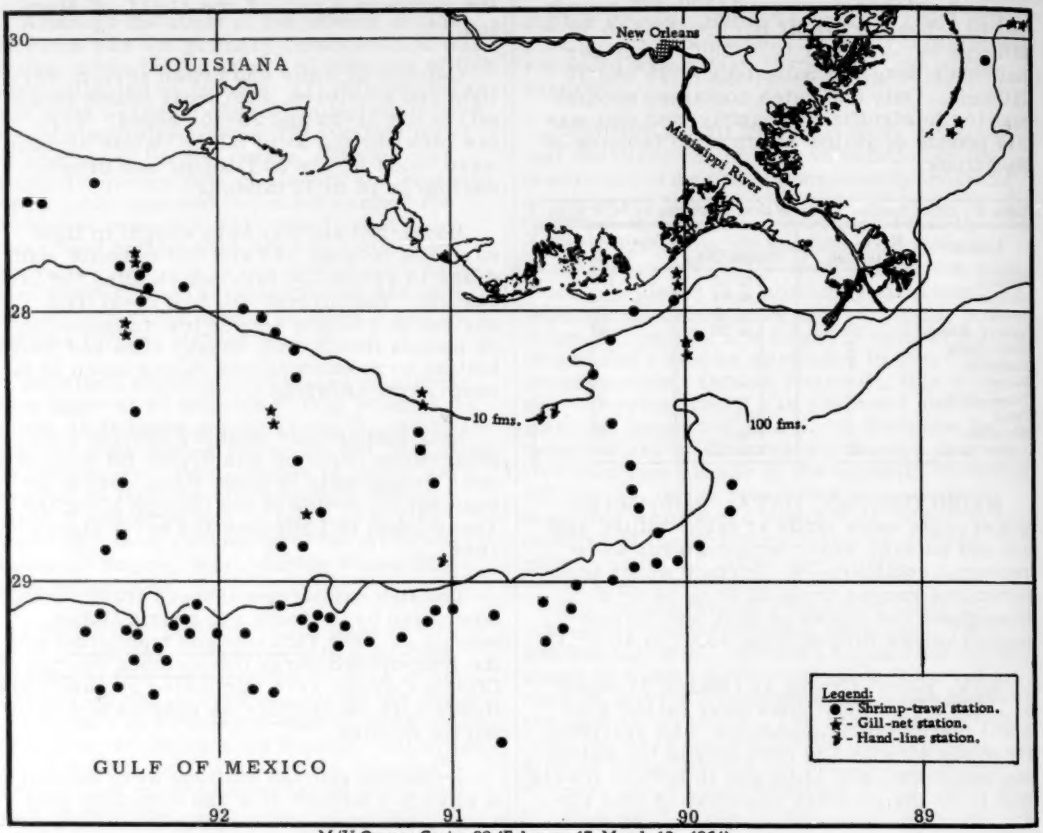
Both inshore and offshore shrimp concentrations found on this cruise off Louisiana were comparable to those found during the exploratory cruise of the Oregon along the Texas coast in February and early March 1964.

The fish catch from inshore trawling was dominated by sciaenid and sparid fishes, notably croaker (Micropogon undulatus) and the long-spined porgy (Stenotomus caprinus). Offshore drags were dominated by gadiforme fishes such as Merluccius species and Urophycis species.

Seventeen gill-net stations were occupied. A total of 8 bottom sets and 9 surface sets were made in depths ranging from $6\frac{1}{2}$ to 38 fathoms. The gill nets used contained No. 7 monofilament nylon thread, made up in four 300-foot sections of $2\frac{5}{8}$-, $2\frac{3}{4}$-, $2\frac{7}{8}$-, and 3-inch stretched mesh. Seven large-scale menhaden (Brevoortia patronus) were caught in bottom sets, 48 were taken in surface sets, and an additional 34 were taken in 65-foot flat trawl drags in shallow water. Twenty-nine bathythermograph casts were made in conjunction with the gill-net sets.

A series of mud samples was collected from selected areas within commercial shrimp grounds for viscosity, adhesiveness, and friction evaluation in connection with a study on the stimulation and response behavior of burrowed shrimp under electrical trawling conditions.

Forty-three plankton tows were made for the U. S. Bureau of Commercial Fisheries Biological Laboratory in Beaufort, N. C.,



M/V Oregon Cruise 90 (February 17-March 13, 1964).

which is also studying menhaden. An additional 12 plankton tows were made for the Florida State Board of Conservation in cooperation with their studies on the distribution of spiny lobster larvae.

Note: See Commercial Fisheries Review, April 1964 p. 17.

Gulf Fishery Investigations

SHRIMP DISTRIBUTION STUDIES:

M/V "Gus III" Cruise GUS-14 (February 8-March 3, 1964) and M/V "Belle of Texas" Cruise BT-33 (February 18-24, 1964): Shrimp sampling studies as well as pink shrimp marking were carried out during these cruises by the chartered research vessels Gus III and Belle of Texas of the U. S. Bureau of Commercial Fisheries Biological Laboratory, Galveston, Tex.

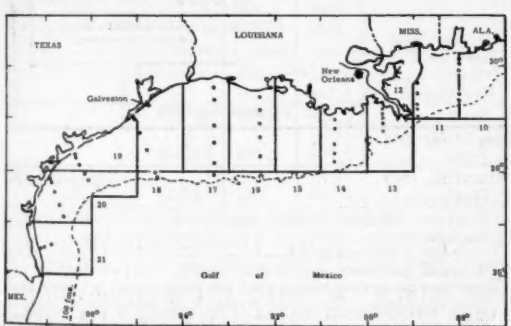
During shrimp sampling in the northwestern Gulf of Mexico, 8 statistical areas (13, 14, 16, 17, 18, 19, 20, and 21) off Louisiana and Texas were covered, with the Gus III surveying eastern stations and the Belle of Texas covering western stations. Standard 3-hour tows with a 45-foot shrimp trawl were made. Shrimp catches were spotty. The only good catch of brown shrimp consisted of 46 pounds of 12-15 count taken at a 25-fathom station off Cameron, La. White shrimp catches consisted mainly of the 41-50 count size which were found off the Texas coast in less than 10-fathom depths of area 18 (26 pounds), area 19 (34 pounds), and area 20 (21 pounds). Area 20 also yielded 34 pounds of 21-25 count white shrimp from 10-20 fathoms. Pink shrimp

were found in only 2 tows, and in both cases the quantity was less than 1 pound.

During the combined cruises of the Gus III and the Belle of Texas, 66 bathythermograph casts were made including 26 on the Tortugas shrimp grounds. Ten special plankton-sled tows on the bottom and 40 regular oblique-step plankton tows in mid-depths were completed. Between the Mississippi Delta and Key West, Fla., 10-drift-bottle stations were established and 12 drift bottles were released at each station.

In addition to shrimp-sampling work, the Gus III completed a pink-shrimp marking study on the Tortugas shrimp grounds off south Florida. Approximately 3,000 pink shrimp were captured, stained, and released.

M/V "Gus III" Cruise GUS-15 (February 28-March 3, 1964 and March 17-22, 1964): Shrimp catches were generally spotty during this cruise in the Gulf of Mexico by the chartered research vessel Gus III. The cruise was conducted in two separate portions within the area of operations extending from off the coast of Louisiana westward to lower Texas. Standard 3-hour tows with a 45-foot shrimp trawl were made in each of the statistical areas covered.



Shows station pattern of M/V Gus III during cruise GUS-15, February 28-March 3, 1964.

White shrimp catches were fair in the 0-10 fathom depth of area 14 (18 pounds of 26-30 count), area 16 (10 pounds of 15-20 count), and area 20 (21 pounds of 31-40 count). The 10-20 fathom depth in area 13 yielded 13 pounds of brown and white shrimp about evenly divided between sizes 15-20 and 26-30 count. The largest catch of brown shrimp (18 pounds of 31-40 count) during the cruise was from that depth in area 19.

During the two portions of this cruise, 51 bathythermograph and 39 nansen bottle casts were made. A total of 29 special plankton-sled tows on the bottom and 50 oblique-step plankton tows were also completed.

Notes: (1) Shrimp catches are heads-on weight; shrimp sizes are the number of heads-off shrimp per pound.
(2) See Commercial Fisheries Review, Apr. 1964 p. 19.

Hawaii

SKIPJACK TUNA LANDINGS, FEBRUARY 1964:

Skipjack tuna landings in Hawaii in February 1964 were about 280,000 pounds. This was 73,000 pounds above the 1948-1963 average for the month. The cumulative catch in January-February 1964 was about 755,000 pounds, or 249,000 pounds above the 1948-1963 average for the 2-months period.

During February 1964 there were 78 productive trips giving an average of 3,590 pounds per trip. Individual catches ranged from 90 pounds to 12,550 pounds. Oahu-based vessels landed 79 percent of the total catch.

Industrial Fishery Products

USE OF FISH REDUCTION PRODUCTS IN POULTRY AND ANIMAL NUTRITION HIGHLY REGARDED:

Mixed feed manufacturers in Delaware, New Jersey, New York, and Pennsylvania, were visited during February 3-11, 1964, by the Chief of the U. S. Bureau of Commercial Fisheries Technical Advisory Unit and the Animal Nutritionist attached to the Unit. Also visited at that time were Agricultural Experiment Stations in those States with the exception of New Jersey, and a visit was made to the Connecticut Agricultural Experiment Station. Observations made by the two nutritionists during the trip and conclusions based on those observations follow:

Practically all the feed-mill officials visited expressed very high regard for fishery by products in poultry and swine nutrition. A definite preference for United States-produced fish meal was expressed by nearly every feed manufacturer visited, the reason usually given for such preference being greater uniformity of the product. There seems to be a general agreement among industrial nutritionists that the most economical poultry and swine rations, all things considered, are those that are supplied with reasonably liberal amounts of fish meal. But this has not always been true, as one research director visited during the trip observed. For example, only two years ago some nutritionists believed that economies could be effected by omitting fish meal and instead enrichening feed mixtures made up entirely of grains and other materials of vegetable origin with synthetic amino acids. Experience has shown that the rations lacking fish meal are

not equal to those containing the fish product and that such omission from poultry rations is false economy.

Levels of fish meal utilization were found to be quite liberal in the area visited. At mills relatively near reduction plants, average utilization is around 7 percent in broiler rations whereas in broiler rations produced by mills farther from fish meal supplies it is around 5 percent. The use of fish meal is relatively liberal in rations for young pigs in Pennsylvania, a typical commercial ration in that State containing 2.5 percent fish meal. However, about twice that level is recommended by experiment station workers at the Pennsylvania State University. Rations are based upon University recommendations containing 5 percent fish meal both in prestarter and starter rations. Pennsylvania leads in pork production among the northern Atlantic Coast States.

A large feed mill in New York State produces a fish food that is 25 percent fish meal and, in addition, incorporates fish meal in rations for laboratory animals.

A possible valuable effect of fish meal on ruminants was suggested to a professor of the Agricultural Experiment Station, University of Delaware (Newark), by a practical livestock man. The suggestion was the feeding of fish meal to prevent cracked hooves in cattle. The professor pointed out that such suggestions, on further investigation, are often found to have practical value. The experiment station workers visited on the trip are, without exception, enthusiastic about the values of industrial fish products in poultry and animal nutrition. Workers at the Agricultural Experiment Station of Cornell University, Ithaca, N. Y., have demonstrated that highly unsaturated lipids increase the food value to poultry of saturated fats like tallow by means of a synergistic interaction. (Menhaden oil is a highly unsaturated lipid.)

* * * * *

U. S. FISH MEAL AND SOLUBLES:

Production and Imports, January 1964: Based on domestic production and imports, the United States available supply of fish meal for January 1964 amounted to 32,813 short tons--12,033 tons (or 57.9 percent) more than during January 1963. Domestic production was 447 tons (or 19.6 percent) less, but imports were 12,480 tons (or 67.5 percent) higher than in January 1963. Peru continued to lead other countries with shipments of 25,090 tons.

U. S. Supply of Fish Meal and Solubles, January 1964 with Comparisons

Item	January 1/1964	January 1963	Total 1963
	....(Short Tons)....		
Fish Meal and Scrap:			
Domestic production:			
Menhaden	2/	-	179,971
Tuna and mackerel	1,124	1,708	21,626
Herring	2/	2/	7,425
Other	714	577	32,624
Total production	1,838	2,285	241,646
Imports:			
Canada	4,150	2,905	50,925
Peru	25,090	12,672	291,544
Chile	-	2,918	24,249
Norway	-	-	1,819
So. Africa Republic	1,528	-	12,296
Other countries	207	-	2,274
Total imports	30,975	18,495	383,107
Available fish meal supply	32,813	20,780	624,753
Fish Solubles:			
Domestic production 2/	1,135	1,422	96,224

(Table continued on next column.)

Product	January 1/1964	January 1963	Total 1963
	.... (Short Tons) ...		
Imports:			
Canada	85	148	2,034
Iceland	-	-	55
So. Africa Republic	109	-	411
Other countries	164	-	4,273
Total imports	358	148	6,773
Available fish solubles supply	1,493	1,570	102,997

1/Preliminary.
2/Included with "other."
3/50-percent solids. Includes production of homogenized condensed fish.

The United States supply of fish solubles (including homogenized fish) during January 1964 amounted to 1,493 tons--a decrease of 4.9 percent as compared with the same month in 1963.

* * * * *

U. S. FISH MEAL, OIL, AND SOLUBLES:

Production by Areas, February 1964: Preliminary data on U. S. production of fish meal, oil, and solubles for February 1964 as collected by the U. S. Bureau of Commercial Fisheries and submitted to the International Association of Fish Meal Manufacturers are shown in the table.

U. S. Production 1/ of Fish Meal, Oil, and Solubles, February 1964 (Preliminary) with Comparisons

Area	Meal	Oil	Solubles	Homogenized 3/
	Short Tons	1,000 Pounds	.... (Short Tons)	
February 1964:				
East & Gulf Coasts	560	651	4/	-
West Coast 2/	1,546	1,330	4/	-
Total	2,106	1,981	813	-
Jan.-Feb. 1964 Total	3,944	2,689	1,948	-
Jan.-Feb. 1963 Total	5,132	748	2,614	50

1/Does not include crab meal, shrimp meal, and liver oils.
2/Includes Hawaii, American Samoa, and Puerto Rico.
3/Includes condensed fish.
4/Includes East, Gulf, and Pacific Coasts.
Note: Beginning with March 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

* * * * *

Production, January 1964: During January 1964, a total of 1,838 tons of fish meal and scrap and 708,000 pounds of marine animal oil was produced in the United States. Compared with January 1963 this was a decrease of 447 tons in meal production and 284,000 pounds in oil production.

The quantity of fish solubles manufactured in January 1964 amounted to 1,135 tons--237 tons less than in January 1963.

Production of tuna and mackerel meal amounted to 1,124 tons which accounted for 61 percent of the January production. Oil from tuna and mackerel (456,000 pounds) comprised 64 percent of the January oil production.

A total of 30,975 tons of fish meal was imported during January 1964--an increase of 67 percent as compared with January 1963.

Table 1 - U.S. Production of Fish Meal, Oil, and Solubles, January 1964 1/ with Comparisons

Product	January		Total
	1/1964	1963	1963
	...(Short Tons)...		
Fish Meal and Scrap:			
Herring	2/	2/	7,425
Menhaden 3/	2/	-	179,971
Sardine, Pacific	1	6	27
Tuna and mackerel	1,124	1,708	21,626
Unclassified	713	571	20,597
Total	1,838	2,285	229,646
Shellfish, marine-animal meal and scrap	4/	4/	12,000
Grand total meal and scrap	4/	4/	241,646
Fish solubles:			
Menhaden	2/	-	73,970
Other	1,135	1,372	15,030
Total	1,135	1,372	89,000
Homogenized condensed fish	-	50	7,224
	..(1,000 Pounds)..		
Oil, body:			
Herring	2/	2/	5,726
Menhaden 3/	2/	-	165,037
Sardine, Pacific	-	-	4
Tuna and mackerel	456	290	5,654
Other (including whale)	252	134	7,588
Total oil	708	424	184,009

1/Preliminary data.
2/Included with unclassified.
3/Includes a small quantity of thread herring.
4/Not available on a monthly basis.
Note: Beginning with February 1963 fish oil is shown in pounds instead of gallons. Conversion factor, 7.75 pounds equal 1 gallon.

Mississippi

SHRIMP CATCH FROM MISSISSIPPI SOUND ANALYZED:

The Mississippi State Gulf Coast Research Laboratory is sampling and studying postlarval shrimp in Mississippi Sound. The research is being done under contract for the U. S. Bureau of Commercial Fisheries. All postlarval shrimp taken from Mississippi Sound during inshorc sampling in November 1962-October 1963 have been identified. The samples included 37,250 penaeid shrimp belonging to the 3 commercial species. Of those, 5,257 were juvenile. Catch composition data for the 1962 commercial catch in Mississippi Sound were also obtained.

Composition of Shrimp Yield from Mississippi Sound

Classification	Composition Species of Shrimp		
	Brown	White	Pink
	.....(Percent).....		
Postlarvae from shrimp sampling, Nov. 1962-Oct. 1963	61.3	32.3	6.3
Commercial catch, 1962	61.0	31.9	6.9

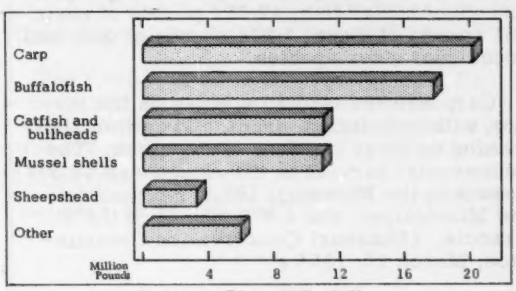
Note: The percentage breakdowns by species do not add to 100 percent.

The postlarval shrimp study in Mississippi Sound will continue through November 1964. (Gulf Coast Research Laboratory, March 6, 1964.)

Mississippi River Fisheries

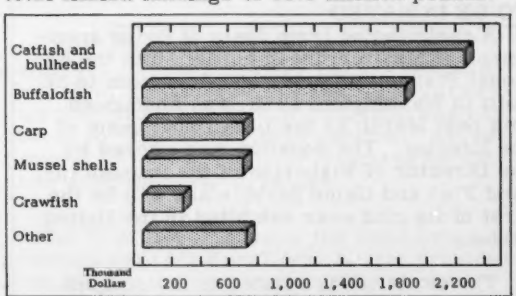
FISHERY LANDINGS, 1962:

Commercial landings of fish and shellfish in the Mississippi River drainage area in 1962 amounted to 69.4 million pounds with a landed value of $6.5 million--down 8.7 percent in quantity and 6.8 percent in value as compared with the 1961 landings.



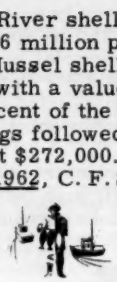
Mississippi River catch, 1962.

The four leading species were carp (20.3 million pounds), buffalofish (17.8 million), catfish and bullheads (11.1 million), sheepshead (3.3 million). Those four species with a combined value of a little more than $5.0 million, accounted for about 95 percent of the total finfish landings of 55.8 million pounds.



Value of Mississippi River catch, 1962.

Mississippi River shellfish production in 1962 totaled 13.6 million pounds valued at $1.1 million. Mussel shell production of 11.0 million pounds with a value of $708,000 made up about 80 percent of the shellfish total. Crawfish landings followed with 2.3 million pounds valued at $272,000. (Mississippi River Fisheries--1962, C. F. S. No. 3408.)



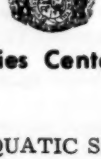
Missouri

COMMERCIAL FISHERIES CATCH IN 1963:

Commercial fishermen took nearly 180 tons of fish in 1963 from the 3 rivers and 1 lake where commercial fishing was permitted in Missouri.

Lake Wappapello, open in 1963 for its first full year of commercial fishing, produced 75,800 pounds of fish, including 54,979 pounds of buffalofish, 17,577 pounds of carp, 651 pounds of drum, 2,274 pounds of gar, and occasional other species.

Carp was the leading species on the rivers, with buffalofish, drum, and catfish also making up large portions of the catch. The commercial harvest in the rivers was 89,397 pounds in the Missouri, 189,571 pounds in the Mississippi, and 4,439 pounds in the St. Francis. (Missouri Conservation Commission, March 16, 1964.)



National Fisheries Center and Aquarium

VARIETY OF AQUATIC SPECIMENS TO BE DONATED:

A contribution from Spain of living specimens of Mediterranean cuttlefish to the National Fisheries Center and Aquarium to be built in Washington, D. C., was announced this past March by the U. S. Department of the Interior. The donation was offered by the Director of Fisheries of the Spanish Inland Fish and Game Service and will be the first of its kind ever exhibited in the United States.

The cuttlefish is related to the octopus and squid and has been well known from ancient times as a producer of dark brown sepia, a favorite writing and illustrating medium of Japanese artists for centuries. Although the cuttlefish is considered an edible species in Europe and is in favor with a specialized trade in some parts of the United States, its main value today is for the production of cuttlebone which is used in bird cages for canaries to sharpen their beaks. The "bone" is enclosed by the skin of the animal's back and actually constitutes what remains of the mollusk shell originally worn by its ancestors.

The Acting Director of the Center said it is expected that aquariums throughout the United States and the world will contribute specimens of aquatic life to the $10 million research and education facility to be built in Washington, D. C. "There are good indications that Japan will provide some of the colorful fish that abound in the Japanese Archipelago," he said. "One of these is the red tai, an important food fish and a relative of the porgy. This species is striking because of its bright red color."

The Center's Acting Director said one of the important contributors will be the Steinhart Aquarium in San Francisco. The curator for Steinhart said his aquarium will donate Pacific moray eels, swell sharks and leopard sharks, and the giant Pacific octopus--the world's largest species. The Pacific octopus reaches a spread of up to 15 feet and a weight of 120 pounds. Other aquariums in the United States are expected to contribute such specimens as piranha, rays, sharks and, dolphins.

A survey has shown that the dolphin--popularly known as a porpoise--is the favorite of aquarium visitors because of its high intelligence, according to the Center's Acting Director. In second place are the sea horse and the more ominous creatures such as the octopus, shark, piranha, electric eels, moray eels, and the sting ray. "These animals have a special fascination," he said. "People are especially curious about things they believe are dangerous, but the reputation of some of the creatures is not fully deserved."

The octopus, for example, has an ancient reputation for being the terror of the deep but in reality it is a comparably mild animal. The reputation persists only because the octopus appears ferocious. The octopus, however, could be extremely dangerous because it has all the equipment, including a poisonous

bite that paralyzes fish. But in its natural habitat, the octopus is skittish as far as man is concerned. In captivity, it loses its fear of man and at times becomes almost tame. Coming into contact with the octopus is more likely to be injurious to the marine animal than a man, it is said. "It isn't difficult to pull away from its suction cups," the Acting Director said. "If you do it too quickly, you might tear off the horny cap the octopus has over each suction."

Another species seen in many aquariums is the piranha. The piranha is not spectacular in size or design, but the paradox of its reputation and mild appearance give that South American fish a special attraction. The piranha is said to be especially dangerous near Indian villages where garbage is thrown in the rivers. The piranha learns to associate a splash with food. In more remote areas, however, the piranha is not likely to attack a swimmer unless it smells blood.

The specimen most sought by all aquariums, and one which the Washington, D. C., Fisheries Center hopes to obtain, is the coelacanth, or "living fossil" fish. Fossils of the coelacanth are found in strata of the Middle Devonian Era, which began about 325 million years ago. It occurred first as a fresh-water fish but later showed up as a marine fish in the Triassic Era, beginning about 190 million years ago. Then none were found, and it was believed the coelacanth had been extinct for at least 100 million years.

The first scientific awareness that the coelacanth was still living occurred in 1938 when one was caught in a trawl off the southeastern coast of Africa. The fish measured about five feet in length and was taken from a depth of about 250 feet. The Center's Acting Director said a few coelacanth were caught in the 1950's in the same area but none remained alive for more than several hours. He said the coelacanth is a true fish, but in the evolutionary tree it is close to where amphibians such as the salamander branched off. He noted that the paired pectoral fins of fish, which become shoulders and arms in evolution, and the pelvic fins, which become hind legs, are in the advance stages of becoming limb-like in the coelacanth. "Finding that fish alive is like finding a living dinosaur," he said.

The Fisheries Center at Washington, D. C., plans to have 1,300 kinds of aquatic life--one of the largest collections in the world. It is expected that many will be donated and the remainder will be purchased. There are some species of aquatic life that it will not be practical to keep at the Center. They include the barracuda, which despite its viciousness is too delicate and nervous to withstand captivity. In confinement, it continually smashes into the sides of its tank and dies of the injuries. The manta ray, which reaches a spread of 22 feet, requires too much area for swimming. Also, it depends on plankton for food, and aquariums cannot supply the microscopic animals and plants in sufficient amounts.

Other species ruled out are those from the deepest parts of the ocean because such fish live in an area of great pressure. When they are brought to the surface they suffer from decompression and usually die. The release of pressure causes small air bubbles to form and block blood vessels. The Fisheries Center plans to display models of the deep ocean fish in a simulated habitat called "Creatures of the Abyssal Depths."

The Center is to be constructed on a 20-acre site at Hains Point in East Potomac Park in Washington, D. C., and is expected to attract 3 million visitors a year. Completion is expected about 1967.

Note: See Commercial Fisheries Review, April 1964 p. 22, October 1963 p. 28, July 1963 p. 45.

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ARCHITECTS SELECTED TO DRAW PLANS: The selection of two architectural firms to jointly prepare plans for the National Fisheries Center and Aquarium in Washington, D. C., was announced on March 10, 1964, by General Services Administrator Bernard L. Boutin and Secretary of the Interior Stewart L. Udall.

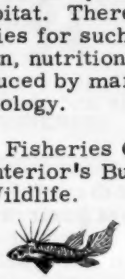
The firms awarded the contract for the plans are in Los Angeles, Calif., and Madison, Wis. Completion of preliminary drawings and alternate design concepts was expected to take about three months. An estimated 20 months will be required to complete final working drawings.

The U. S. Department of the Interior's proposed 1964/65 fiscal year budget provides $500,000 for the preparation of final plans. Financing arrangements for the $10 million

Center are unique in that they provide that the Government research and educational institution will be self-supporting. Both construction and operation costs are to be paid from an admission charge to all except student groups.

The Center will show one of the world's largest collections of aquatic animals in near natural habitat. There will be extensive research facilities for such studies as genetics, reproduction, nutrition, fish diseases, antibiotics produced by marine animals, and experimental ecology.

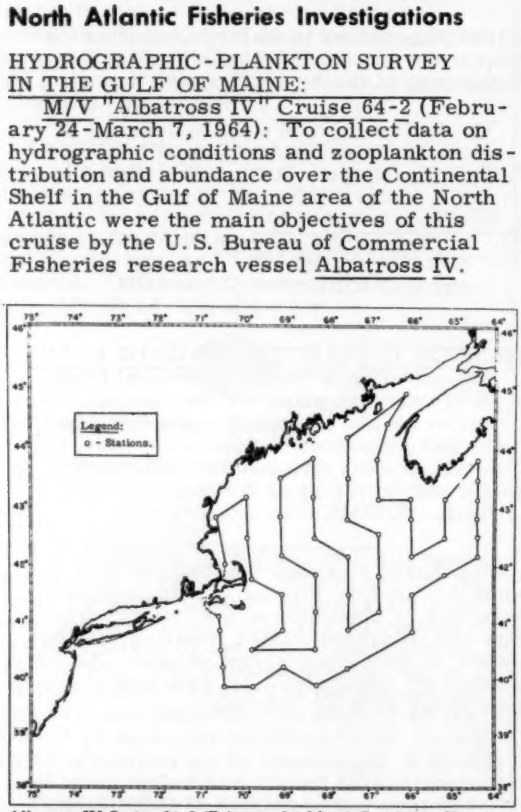
The National Fisheries Center will be administered by Interior's Bureau of Sport Fisheries and Wildlife.



North Atlantic Fisheries Investigations

HYDROGRAPHIC-PLANKTON SURVEY IN THE GULF OF MAINE:

M/V "Albatross IV" Cruise 64-2 (February 24-March 7, 1964): To collect data on hydrographic conditions and zooplankton distribution and abundance over the Continental Shelf in the Gulf of Maine area of the North Atlantic were the main objectives of this cruise by the U. S. Bureau of Commercial Fisheries research vessel Albatross IV.



Albatross IV Cruise 64-2 (February 24-March 7, 1964): Vessel track and hydrographic-plankton stations.

Planned observations were completed at 53 of the 54 plankton-hydrographic stations scheduled. At each station, samples for temperature, oxygen, salinity, chlorophyl, and zooplankton were taken. A total of 98 bathythermograph observations were made, and 265 drift bottles and 265 sea-bed drifters were released.

Two oblique tows with a midwater trawl were made in deep water off the edge of the Continental Shelf. The Myctophidae taken in those tows was forwarded to a scientist associated with the British Museum.

At the start of the cruise, an attempt was made to secure live haddock for blood samples and aquarium specimens, but the operation was hampered by poor weather conditions.

Oceanography

EDUCATIONAL GRANTS FOR 1964 AWARDED BY INTERIOR DEPARTMENT:

Graduate educational grants to 17 universities as part of the National Oceanographic Program were awarded by the U. S. Department of the Interior, Secretary Udall announced on March 11, 1964.

The universities awarded those grants will select outstanding student scientists, who have been graduated or are about to be graduated to receive 1- or 2-year grants. The awards will be available at the beginning of the 1964 fall semester. Grants will be for study in the fields of economics, fishery technology, taxonomy (science of classification), physical and chemical oceanography, marine biology, and fishery biology.

The 1964 awards by Interior will support 20 new student recipients. Part of the funds also may be used to continue the training of seven students already participating in the study program. Grants provide for payment of tuition fees and a living expense allowance of $3,000 a year. Married students with children receive an additional $1,000 family allowance. At the close of the academic year, each student's progress is reviewed before a second-year grant is approved.

Secretary Udall said the program began in 1962, following Congressional action, to

assist in developing scientists in fishery oceanography. It is administered by Interior's Bureau of Commercial Fisheries, which makes $200,000 available each year for the study program. Selection of institutions to receive the grants is made by the Department of the Interior with the advice of a panel representing leading universitites and research institutions. All qualified institutions are invited to participate in the program. Grants were made to 17 universities in 1963 and to 12 in 1962.

Student applications for grants are made directly to the university of their choice. The actual number of participating students will depend upon decisions by the universities in selecting students for one or two-year participation.

Universities to receive the 1964 grants and fields of study are:

University of California at Berkeley, fishery technology; University of California at San Diego (Scripps Institution of Oceanography), oceanography and marine biology; Columbia University (Lamont Geological Observatory), oceanography; Cornell University, taxonomy; Duke University, marine biology; University of Hawaii, marine biology; Iowa State University, fishery biology; The Johns Hopkins University, oceanography; Massachusetts Institute of Technology, oceanography and fishery technology; University of Miami (Institute of Marine Science), fishery biology and taxonomy; University of Michigan, fishery biology and taxonomy; North Dakota State University, fishery technology; Oregon State University, oceanography and fishery technology; University of Rhode Island, marine biology or oceanography; University of Virginia (Virginia Institute of Marine Science), marine biology; University of Washington, fishery economics, oceanography, and fishery biology; and University of Wisconsin, fishery biology.

Note: See Commercial Fisheries Review, May 1963 p. 34.

Oysters

HARVEST IN SPRING MONTHS SUGGESTED:

The belief that oysters are good to eat only during months that have an "R" is a myth, according to biologists of the U. S. Bureau of Commercial Fisheries. Oysters usually reach their peak of perfection in May and June--months that have no "R" in them. Oysters are fatter and taste better in the spring because at that time they begin to store glycogen, and animal starch, in preparation for the spawning season in summer.

Maryland pan fried oysters (see p. 11 for recipe).

During summer and early fall, oysters become thinner, their nectar becomes comparatively watery, and their flavor declines. The fattening cycle usually does not resume until October or November. The harvest of oysters, however, usually begins in September or October--a time when oysters generally are not at their best.

Several reasons for the conflict between harvesting and natural growth were explained by the Bureau of Commercial Fisheries' Assistant Director for Biological Research. The oyster harvest is begun in early fall because the demand is seasonal and the prices are highest at that time. The seasonal demand may have been caused by the "R-month" myth. Another reason is that most oysters are marketed in the raw shucked state and, in the early

days, storage life probably was longer in cooler weather. Some of the origins of the "R-month" myth may have been lost in history, but one of the apparent origins is the spawning methods of the European oyster. That oyster is unique in that its young are retained by the mother until tiny shells are developed. The presence of the small gritty shells makes the European oyster undesirable for human food during the non "R-months."

Changing the oyster harvest time in the United States to late spring could result in important economic benefits to the oyster in-

dustry. Oyster mortalities usually are heaviest in summer, and losses of 25 to 50 percent are not uncommon. Thus, an earlier harvest could result in obtaining many more bushels of oysters in a given area. Further, because oysters are fatter in the spring, there would be a much greater yield of meats in each bushel harvested.

The tradition of the fall harvest is unlikely to change, however, until enough consumers become aware that the "R-month" rule is a myth and start asking for oysters in spring months.

Pollution

CONFERENCE ON MILFOIL CONTROL: A conference on the Eurasian water milfoil problem was held early in 1964 in Annapolis, Md. The meeting (the Fifth Annual Workshop) was attended by about 60 specialists, including officials of state and Federal agencies, universities, and the chemical industry. The prolific growth of milfoil (an aquatic plant) is causing problems in Chesapeake Bay and other areas.

The chairman of the meeting stressed that realistic estimates must be made of the present and potential threat by milfoil to recreational use of water, to real estate values, to shellfish, and to wildfowl feeding areas. Careful attention must also be given to any possible dangers resulting from the use of chemicals in controlling milfoil. All of those estimates are necessary in reaching wise decisions on control.

The problems associated with milfoil were further outlined in a speech by the Director of the Natural Resources Institute of the University of Maryland. He traced the rapid growth of water milfoil in the upper Chesapeake Bay since 1959, its wide distribution, and the present threat to Cheapeake Bay resources. He cited the substantial success which has been achieved in the development of chemical methods which can control milfoil in local areas. But he also mentioned the need for additional information on chemical methods of control. Precise methods for detecting herbicide residues are needed. A better understanding of the biological effects of chemicals on marine life, wildlife, and plants is needed, and specific information should be developed to guide those state agencies which must set regulations.

It was reported that new areas were invaded by milfoil in 1963, including the Patuxent River in Maryland, additional areas in Virginia, parts of the Tennessee Valley, and other locations. Tidal waters have been found to pose exceptional difficulties in control.

Maryland state officials have established a procedure for considering requests to use certain herbicides in Maryland waters. The procedure will apply to the requests of individuals or groups who wish to control water milfoil in late May or June (the only time it is susceptible). The Maryland Department of Tidewater Fisheries will handle requests affecting tidal water, and the Maryland Game and Inland Fish Commission will handle requests affecting fresh water areas. Both agencies will work closely with the Maryland Health Department and Water Pollution Control Commission in reviewing requests.

Looking to the future, biologists reported that certain insects present on milfoil in Pakistan, and a plant-eating fish from Japan, called the "sogyo," are under study as possible aids in control.

Specialists described plans for chemical control of 750 acres of water in the Tennessee Valley. Scientists also discussed plans to screen and test new herbicides, and plans for a thorough study of any direct or indirect toxic effects on plants and animals.

Current Federal legislation which might assist in future efforts to control milfoil was summarized by the U. S. Army Corps of Engineers. (Natural Resources Institute, University of Maryland, February 24, 1964.)

Salmon

NEW FISH FARM IN WASHINGTON STATE ESTABLISHED BY COOPERATIVE EFFORT:

A new salmon fish farm in Washington State will start production in 1964 through the joint efforts of a sport fishermen's club, land owners, and the Washington State Department of Fisheries. The new natural production area is Campbell Slough in the Humptulips River Delta about nine miles northwest of Hoquiam, Wash. The slough comprises approximately 10 acres of water area which drains into North Bay.

A land owner in the area built a dike and installed a tide gate near the outlet of the slough to reclaim the area as a fresh-water lake. The Fisheries Department surveyed the slough, and took water samples for analysis to determine the site's potential for salmon production. The results were favorable. Water quality is such that chinook fingerlings can be raised to migrant size without a feeding program. After scrap fish are removed from the slough by rotenone treatment, chinook salmon will be planted.

A sport fishermen's club in Grays Harbor will purchase all the material necessary for a permanent fish-rearing installation, and the State Fisheries Department will complete the project, thus Washington will gain a new fish farm through the multiple efforts of the sportsmen, land owners, and the Fisheries Department.

Adult salmon returning to the new fish farm will contribute to the commercial and sport fisheries offshore, at Westport and Grays Harbor. (Washington State Department of Fisheries, February 28, 1964.)

Shrimp

UNITED STATES SHRIMP SUPPLY INDICATORS, FEBRUARY 1964:

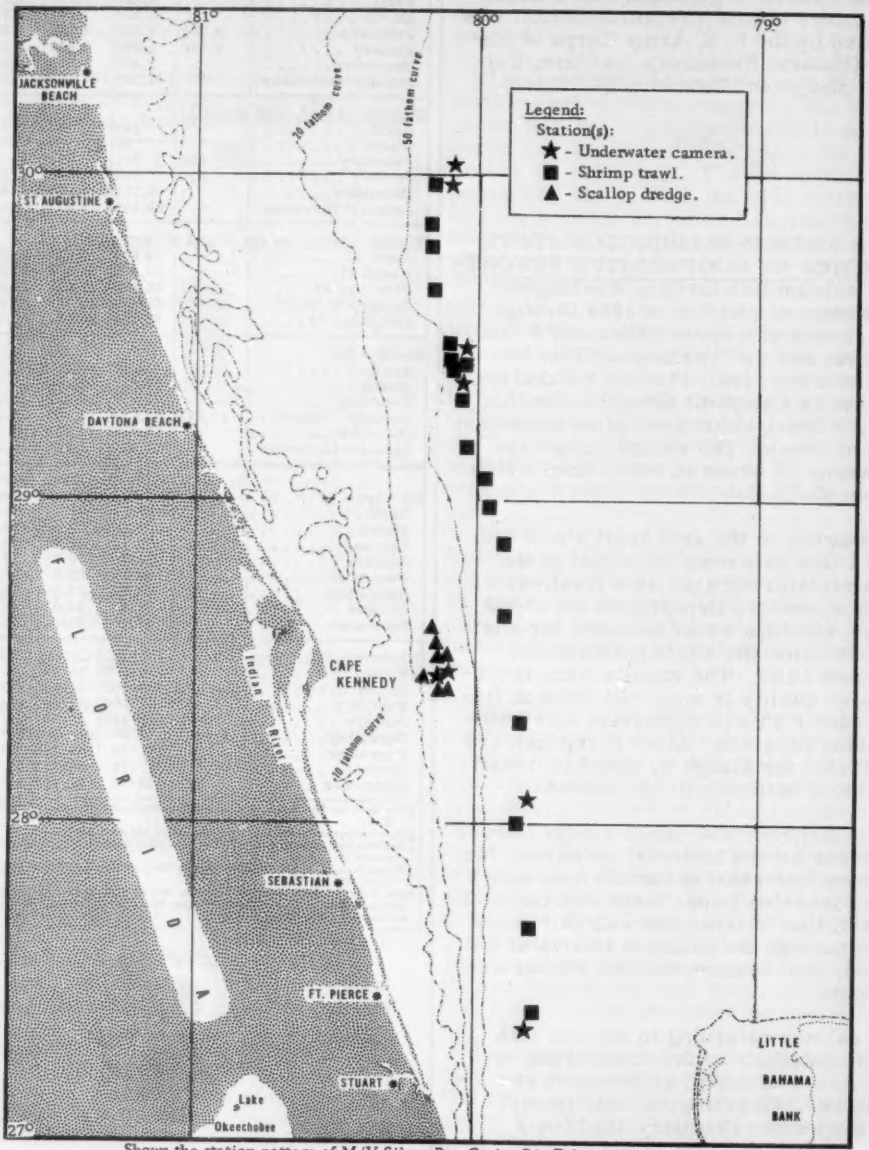
Item and Period	1964	1963	1962	1961	1960
	..... (1,000 Lbs., Heads-Off)				
Total landings, So. Atl. and Gulf States:					
April	-	4,427	3,358	3,171	4,728
March	-	3,632	3,331	4,754	4,099
February	4,000	2,986	4,123	3,910	3,784
January	6,160	3,993	3,840	5,686	5,402
December	-	9,409	8,615	6,538	7,099
January-December	-	138,187	105,839	91,396	141,035
Quantity canned, Gulf States 1/:					
April	-	105	12	9	66
March	-	92	86	35	117
February	309	281	241	90	204
January	359	592	492	183	266
December	-	2,175	1,879	816	894
January-December	-	29,468	23,322	14,500	26,394
Frozen inventories (as of end of each mo.) 2/:					
April 30	-	24,954	15,637	27,492	20,502
March 31	-	27,970	16,607	31,345	23,232
February 29	-	28,039	19,012	37,612	29,063
January 31	43,896	26,487	21,328	37,842	34,332
December 31	-	45,764	31,577	19,755	40,913
Imports 3/:					
April	-	11,082	10,210	9,208	7,733
March	-	13,616	9,658	10,347	8,545
February	-	12,100	10,599	8,932	7,657
January	13,272	13,139	12,907	12,338	8,596
December	-	16,296	15,798	15,442	12,411
January-December	-	151,530	141,183	126,268	113,418
	... (¢/lb., 26-30 Count, Heads-Off) ..				
Ex-vessel price, all species, So. Atl. and Gulf Ports:					
April	-	83.6	82.2	55.4	60.6
March	-	85.5	80.9	56.0	56.3
February	4/57-65	85.7	78.9	53.5	51.8
January	4/57-69	85.0	76.3	52.5	49.5
December	-	59.6	82.9	75.2	54.2
November	-	52.3	84.5	73.5	54.0
October	-	53.3	90.0	68.7	53.0
September	-	57.9	90.9	70.1	52.2
Wholesale price, froz. brown (5-lb. pkg.) Chicago, Ill.:					
April	-	100-105	94-97	69-70	74-75
March	-	102-106	94-95	69-71	65-68
February	73-82	102-106	93-95	69-71	65-67
January	78-83	102-106	91-94	69-71	64-66
December	-	75-83	101-107	91-92	68-70
November	-	71-78	105-110	89-92	69-73
October	-	67-75	108-115	83-90	69-73
September	-	73-77	113-118	87-90	65-70

1/Pounds of headless shrimp determined by multiplying the number of standard cases by 30.3.
2/Raw headless only; excludes breaded, peeled and deveined, etc.
3/Includes fresh, frozen, canned, dried, and other shrimp products as reported by the Bureau of the Census.
4/Range in prices at Tampa, Fla.; Morgan City, La., area; Port Isabel and Brownsville, Texas only.
Note: February 1963 landings and quantity used for canning estimated from information published daily by the New Orleans Fishery Market News Service. To convert shrimp to heads-on weight multiply by 1.68.

South Atlantic

Exploratory Fishery Program

ROYAL-RED SHRIMP AND CALICO SCALLOP GROUNDS PHOTOGRAPHED: M/V "Silver Bay" Cruise 54 (February 4-16, 1964): To obtain bottom photographs in the center of the royal-red shrimp range (200 fathoms) off Florida's east coast was the main objective of this cruise by the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Silver Bay. For this purpose an underwater camera was used at 8 stations extending from St. Augustine southward to below Fort Pierce.



Shows the station pattern of M/V Silver Bay Cruise 54, February 4-16, 1964.

A total of 500 feet of 35 millimeter black and white film was exposed in royal-red shrimp depths with a self-contained still camera equipped with electronic flash. Attempts to obtain 16 millimeter motion picture footage were unsuccessful because of heavy seas. An additional 200 feet of 35 millimeter black and white film was exposed on bottom on the calico scallop grounds (26½ fathoms) off Cape Kennedy. Development of test film strips aboard the vessel showed that good photographs were obtained in both depth ranges.

In depths of from 160 to 225 fathoms, 18 shrimp trawl drags yielded small catches of royal-red shrimp, ranging up to 70 pounds (21 to 46 heads-on count) for each 3-hour drag. An unusually low bottom temperature of 46° F. was obtained in 225 fathoms east of Daytona Beach.

Catches of calico scallops on this cruise ranged from a few individuals to 4 bushels for each drag. These were made in eight 30-minute drags using a 6-foot tumbler dredge in the 25 to 28 fathoms depth range off Cape Kennedy. The scallop meats were in fair condition and averaged 105 count to the pound.

South Carolina

FISHERIES BIOLOGICAL RESEARCH PROGRESS, JANUARY-MARCH 1964:

A report on the progress of biological research by the Bears Bluff Laboratories, Wadmalaw Island, S. C., for January-March 1964, follows:

Oyster Studies: Experiments were continued on the supplemental feeding of oysters during this period. Again the studies indicate that oysters maintained in 12 x 12 foot concrete tanks, when fed with cracked rice, gain 3.5 percent in underwater weight in a month when compared with oysters of similar size and weight used as controls and unfed. This was true for controls both in the experimental tanks and in trays suspended under the Laboratory docks on We Creek.

Shrimp Studies: Catch-per-unit-of effort data in experimental trawling throughout coastal waters during January-March 1964 indicated that most commercial species of marine organisms were less abundant than during the same periods in 1963 and 1962.

Average Catch Per Unit of Effort Experimental Trawling, January-March at Eighteen Regular Stations

Year	Spot	Croaker	White Shrimp	Blue Crabs	
				Mature	Immature
1964	0.7	9.5	-0.1	3.2	9.4
1963	7.9	10.2	3.2	8.1	8.6
1962	22.1	18.6	26.3	14.1	23.9

As can be seen in the table, a continual decline in the abundance of the species listed, with the exception of immature blue crabs, has taken place since 1962. White shrimp were almost nonexistent in experimental trawling during the first 3 months of 1964, and only two specimens were found in more than 75 standard trawl drags. It is apparent from this that very few white shrimp wintered-over in coastal waters.

Spot and mature blue crabs also showed considerable declines in numbers during January-March of 1964 as compared with the same quarters in 1963 and 1962. Croakers, while only slightly less numerous at stations during the 1964 quarter as compared with that of 1963, nonetheless showed a general pattern of decreased abundance for the three year period.

The reasons for the decline in abundance of commercial species during January-March over the past three years are not known at present. One possibility is that a very slight decline in average water temperature along the coast is responsible for the changes noted, although no such changes have been observed in the course of shrimp survey studies. It is possible that these changes, however, have been so gradual and slight as to escape detection by ordinary methods. It has been observed that spiny dogfish (Squalus acanthias), a small species of shark ordinarily found in colder northern waters, has become increasingly abundant in coastal waters during the past three years, and this may give some indication that water temperatures are playing a part in the changes which have taken place during that period.

Plankton Studies: Experimental plankton collections were made from Little River, south of Calibogue Sound, during January-March of this year. Postlarval brown shrimp began to appear in plankton samples in early February 1964, but reached no significant abundance until late February and early March. To date the postlarvae have been

slightly less abundant at plankton stations located from Charleston Harbor south to Calibogue Sound, S. C., than during the same period of 1963. Recruitment of those postlarvae at stations located north of Charleston Harbor has been greater than to the south, and through March of this year has been slightly improved over that of 1963.

On the whole, the outlook for brown shrimp in 1964 appears about the same, if perhaps even less promising, as the outlook in 1963 was at the end of the first quarter.

Larval and postlarval spot, menhaden, and flounder showed normal or above normal recruitment in coastal waters January-March 1964. Phenomenal numbers of postlarval menhaden were observed in Breach Inlet and Little River Inlet during February and March of this year. Apparently successful offshore spawning of spot and menhaden, as well as flounder, took place in December and January resulting in the unusual abundance of these fishes in plankton collections.

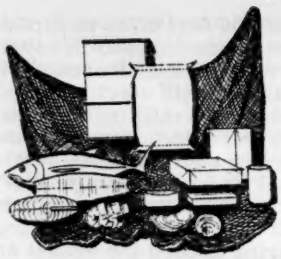
Pond Cultivation: The major ponds at the Laboratory are being prepared to begin further experiments on the cultivation of shrimp in ponds. The flood gates to the 1-acre "Fish Pond" have been adjusted to allow a flow of about 1½-acre feet of water in and out of the pond on each tide. When the flood gates are thus adjusted about 18 inches of water remains in the pond at all times. Postlarval brown shrimp (Penaeus aztecus) made their appearance in We Creek, which waters feed the ponds, beginning on March 9. The flood gates were to remain open until the first part of April in an attempt to trap a sizable population of postlarval shrimp in the pond for "pasturing" and growth.

United States Fisheries

MORE FISHERY PRODUCTS USED IN UNITED STATES IN 1963:

A record 11.2 billion pounds of fishery products were landed and imported in the United States in 1963 as compared with the previous high of 10.4 billion pounds in 1962. Some 6.7 billion pounds of fish was converted into industrial fishery products, with the remainder used for human food.

The increased supply of fishery products in the United States in 1963 was due to a gain of more than 1.5 billion pounds which was used for industrial products--mostly fish meal. But the United States per capita consumption of edible fishery products for the year dropped about one-tenth of a pound from 1962. Plentiful supplies of poultry and beef at relatively low prices were believed responsible for the lower consumption of fishery products.



For the first time, imports accounted for more than half of the total supply of fishery products in the United States. Landings by domestic fishermen in 1963 provided only about 42 percent of the total as compared with 52 percent in 1962. United States fishery landings of 4.75 billion pounds during the year with an ex-vessel value of $378 million provided about 55 percent of the edible fish supply for the United States and only about 34 percent of the inedible supply were used for industrial products.

Despite a 600-million-pound drop from the previous year in the United States fishery landings, and a decrease in value of $18 million, the 1963 value was second only to 1962 when it was $396 million. Most of the decline in landings was due to the lower menhaden catch (down 568 million pounds)--a species used for fish meal and oil. Landings also were lower for salmon, whiting, ocean perch, Pacific mackerel and sardines, haddock, Maine herring, and blue crab. But total United States shrimp landings were up 49 million pounds, 24 million pounds more of king crab were landed, and landings of yellowtail flounder were up 22 million pounds from 1962.

A review of the United States 1963 commercial fishery landings by regions follows:

New England and North Atlantic: There was a large increase in landings of North Atlantic tuna, but groundfish landings such as cod, haddock, and ocean perch, were down. Herring was down because of low demand. Most of the sharply increased yellowtail flounder landings were at New Bedford, Mass. The domestic tuna catch in the North Atlantic was a record breaking 18 million pounds.

Middle Atlantic: Menhaden landings dropped sharply to only 366 million pounds, about 400 million pounds below 1962.

Chesapeake Bay: There was a sharp decline in crabs and menhaden. Croaker and oysters also were down.

South Atlantic: The poorest shrimp landings in years were experienced, but a record was established in the catch of blue crabs. Menhaden landings showed a strong rise.

Gulf of Mexico: Oyster production set a new record, and shrimp landings were the best since 1955. Menhaden and blue crabs were down slightly.

Pacific Coast and Hawaii: There were good landings of albacore tuna, but yellowfin was down, with virtually no change in the over-all quantity of tuna landed. Sardines again failed to appear in quantity off southern California. In Washington, a large pink salmon run brought the total salmon catch to 55 million pounds, compared with 23 million pounds in 1962. The catch of Dungeness crabs was less than normal.

Alaska: King crab production set a record. The salmon catch was down due to smaller runs. Halibut landings were below 1962 but the Dungeness crab catch was up nearly 3 million pounds.

The United States with about 6 percent of the world fishery landings in 1963 remained in fifth place among the world's leading fishing nations. Japan ranked first, followed by Peru, Communist China, and the Soviet Union.

U. S. Foreign Trade

IMPORTS OF CANNED TUNA UNDER QUOTA:

United States imports of tuna canned in brine during January 1-February 29, 1964, amounted to 4,234,009 pounds (about 201,619 standard cases), according to preliminary data compiled by the U. S. Bureau of Customs.

The quantity of tuna canned in brine which can be imported into the United States during the calendar year 1964 at the 12½-percent rate of duty has not been announced; however, in 1963 the quota was 63,130,642 pounds (or about 3,006,221 standard cases of 48 7-oz. cans). Any imports in excess of that quota would have been dutiable at 25 percent ad valorem.

* * * * *

PROCESSED EDIBLE FISHERY PRODUCTS, JANUARY 1964:

United States imports of processed edible fishery products in January 1964 were up 14.7 percent in quantity and 2.2 percent in value from those in the previous month. In January 1964, there were higher imports of most fish fillet items, fish blocks and slabs, and canned sardines (in oil and not in oil). The increase was partly offset by a sharp drop in arrivals of canned tuna in brine.

Compared with the same month in 1963, imports in January 1964 were up 29.0 percent in quantity and 35.9 percent in value. There was a substantial increase this January in imports of fish blocks and slabs, cod fillets, ocean perch fillets, flounder fillets, sea catfish fillets, yellow pike fillets, canned tuna in brine, canned sardines (in oil and not in oil), and canned oysters. But there was a noticeable decline in imports of haddock fillets.

U. S. Imports and Exports of Processed Edible Fishery Products, January 1964 with Comparisons

Item	Quantity January		Value January	
	1964	1963	1964	1963
	(Millions of Lbs.)		(Millions of $)	
Imports[1/]	49.2	37.9	14.0	10.3
Exports[2/]	4.4	3.7	1.5	1.6

1/Includes only those fishery products classified by the U. S. Bureau of the Census as "Manufactured foodstuffs." Included are canned, smoked, and salted fishery products. The only fresh and frozen fishery products included are those involving substantial processing, i. e., fish blocks and slabs, fish fillets, and crab meat. Does not include fresh and frozen shrimp, lobsters, scallops, oysters, and whole fish (or fish processed only by removal of heads, viscera, or fins, but not otherwise processed).
2/Excludes fresh and frozen.

Exports of processed edible fish and shellfish from the United States in January 1964 were up 2.3 percent in quantity but down 28.6 percent in value from those in the previous month. A sharp increase in exports of the lower-priced canned mackerel was about offset by a decline in shipments of canned squid and the higher-priced canned salmon and canned shrimp.

Compared with the same month in 1963, the exports in January 1964 were up 18.9 percent in quantity but down 6.3 percent in value. This January there were much larger exports of canned mackerel and shipments of canned shrimp were also somewhat higher, but exports were down sharply for canned salmon and canned squid.

Notes: (1) Prior to October 1963, the data shown were included in news releases on "U. S. Imports and Exports of Edible Fishery Products." Before October 1963, data showing "U. S. Imports of Edible Fishery Products" summarized both manufactured and crude products. At present, a monthly summary of U. S. imports of crude or nonprocessed fishery products is not available; therefore, only imports of manufactured or processed fishery products are reported. The import data are, therefore, not comparable to previous reports of "U. S. Imports of Edible Fishery Products."

The export data shown are comparable to previous data in "U. S. Exports of Edible Fishery Products," The export data in this series of articles have always been limited to manufactured or processed products.

(2) See Commercial Fisheries Review, April 1964 p. 37.

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AIRBORNE IMPORTS OF FISHERY PRODUCTS, DECEMBER 1963:

Airborne fishery imports into the United States in December 1963 were up 38.1 percent in quantity and 32.1 percent in value from those in the previous month. The increase was due mainly to greater arrivals of shrimp from Venezuela.

Raw headless shrimp continued to make up the bulk of the airborne shrimp imports--in December 1963, shipments consisted of 702,423 pounds of fresh or frozen raw headless, 12,267 pounds of frozen raw peeled, and 34,996 pounds of unclassified shrimp. About 98 percent of the airborne shrimp arrivals in December entered through the U. S. Customs District of Florida. The remainder entered through the Customs Districts of Laredo (Tex.) and Puerto Rico.

Airborne imports of shellfish other than shrimp in December consisted of 73,777 pounds of fresh or frozen spiny lobster products and 13,660 pounds of scallops, all of which entered through the Customs District of Florida.

Total airborne imports of fishery products in 1963 were about the same as those in 1962, although there were changes in shipments from individual countries. A sharp increase in airborne shipments of shrimp from Venezuela in 1963 was partly offset by a decline in airborne shrimp shipments from Panama, Costa Rica, Nicaragua, El Salvador, and Guatemala. The leading shellfish items other than shrimp imported by air in 1962 and 1963 were live northern lobsters from Canada and fresh and frozen spiny lobster products from Central and South American countries. Airborne shipments of north-

U. S.[1] Airborne Imports of Fishery Products, January-December 1963 with Comparative Data

Product and Origin [2]	1963 December Qty.[3] 1,000 Lbs.	1963 December Value[4] US$ 1,000	1963 Jan.-Dec. Qty.[3] 1,000 Lbs.	1963 Jan.-Dec. Value[4] US$ 1,000	1962 Jan.-Dec. Qty.[3] 1,000 Lbs.	1962 Jan.-Dec. Value[4] US$ 1,000
Fish:						
Mexico	-	-	264.8	70.0	964.5	160.3
British Honduras	-	-	43.5	10.7	39.8	8.7
Honduras	-	-	16.5	4.3	2.8	0.6
Japan	[5]	0.1	2.0	8.3	-	-
United Kingdom	1.0	1.9	4.5	9.3	0.7	1.8
Iran	-	-	1.2	7.4	13.9	142.9
France	0.5	0.5	10.6	11.1	0.3	0.7
Rumania	-	-	-	-	1.9	15.9
Panama	-	-	0.9	0.4	7.8	1.3
U.S.S.R.	-	-	26.8	70.2	-	-
Canada	2.2	0.9	2.2	0.9	22.1	17.6
Costa Rica	-	-	-	-	5.6	0.9
Other countries	-	-	3.5	0.9	39.0	12.8
Total Fish	3.7	3.4	376.5	193.5	1,098.4	363.5
Shrimp:						
Guatemala	-	-	141.6	74.0	321.9	164.2
El Salvador	40.3	28.8	338.0	219.0	716.5	447.9
Honduras	-	-	99.8	52.3	39.8	25.2
Nicaragua	12.3	6.7	517.3	181.3	1,008.6	343.6
Costa Rica	46.5	24.1	644.8	308.4	819.9	370.5
Panama	91.7	58.7	1,633.0	890.2	1,867.1	1,055.2
Venezuela	547.7	201.1	5,048.2	2,297.9	3,380.1	1,815.3
Ecuador	-	-	111.6	39.4	12.2	3.4
France	-	-	2.6	0.9	-	-
Mexico	-	-	13.2	6.9	24.7	9.0
Netherlands Antilles	-	-	-	-	3.1	2.7
Argentina	-	-	-	-	10.5	4.9
British Honduras	-	-	7.9	8.6	-	-
Jamaica	11.2	2.9	11.2	2.9	-	-
Total Shrimp	749.7	322.3	8,569.2	4,081.8	8,204.4	4,241.9
Shellfish other than Shrimp:						
Mexico	-	-	101.1	60.8	94.0	61.6
British Honduras	34.1	29.3	378.6	311.1	317.1	219.3
El Salvador	-	-	5.0	3.6	7.1	5.1
Honduras	-	-	17.0	7.0	141.5	104.5
Nicaragua	18.7	13.3	183.2	113.3	18.7	16.2
Costa Rica	-	-	73.8	60.1	7.1	6.0
Jamaica	20.1	17.1	86.6	67.3	43.3	30.2
Netherlands Antilles	-	-	45.5	32.7	56.0	34.8
Colombia	-	-	8.0	21.7	1.8	5.1
Ecuador	-	-	2.2	1.8	3.7	2.1
Tunisia	-	-	0.8	0.9	-	-
Leeward and Windward Islands	-	-	1.6	0.5	31.3	11.9
British Guiana	-	-	1.7	0.3	-	-
Canada	-	-	213.3	109.2	224.1	91.1
Venezuela	-	-	13.7	6.0	32.3	20.3
Panama	14.1	7.1	19.1	10.9	1.0	1.0
Guatemala	-	-	-	-	12.9	6.3
Bahamas	-	-	5.3	5.2	37.5	12.3
Dominican Republic	0.4	0.1	25.7	23.9	33.2	28.3
Yugoslavia	-	-	1.2	0.7	-	-
Trinidad	-	-	-	-	2.3	1.0
Other countries	-	-	2.0	2.9	8.3	12.0
Total Shellfish (except shrimp)	87.4	66.9	1,185.4	839.9	1,075.2	669.1
Grand Total	840.8	392.6	10,131.1	5,115.2	10,378.0	5,274.5

1/Imports into Puerto Rico from foreign countries are considered to be United States imports and are included. But United States trade with Puerto Rico and with United States possessions and trade between United States possessions are not included.
2/When the country of origin is not known, the country of shipment is shown.
3/Gross weight of shipments, including the weight of containers, wrappings, crates, and moisture content.
4/F. o. b. point of shipment. Does not include U. S. import duties, air freight, or insurance.
5/Less than 50 pounds.
Note: These data are included in the over-all import figures for total imports, i. e., these imports are not to be added to other import data published.
Source: United States Airborne General Imports of Merchandise, FT 380, December 1963, U. S. Bureau of the Census.

ern lobsters from Canada in 1963 were similar to those in the previous year. British Honduras was the leading supplier of airborne imports of spiny lobsters in both 1962 and 1963. In 1963, a sharp decline in airborne arrivals of spiny lobsters from Honduras was offset by increased spiny lobster shipments from Nicaragua. Fish fillets from Mexico were the leading finfish product (from a volume standpoint) imported by air in both 1962 and 1963, although the quantity was down sharply in 1963. The airborne imports in both years included several high-value shipments of caviar.

The data as issued do not show the state of all products--fresh, frozen, or canned--but it is believed that the bulk of the airborne imports consists of fresh and frozen products.

Washington

LANDINGS OF FISH AND SHELLFISH, 1963: Landings of fish and shellfish in Washington State in 1963 amounted to 147,916,231 pounds valued at $23,027,000 as compared with landings of 116,519,289 pounds valued at $19,534,014 in 1962.

Total Washington landings in 1963 included 53.8 million pounds of salmon, highlighted by a catch of 31.1 million pounds of pink salmon. Considering the cycle year of the pink salmon and Adams River sockeye salmon runs, the 1963 total landings (all species) are no better than average and have been exceeded 10 times during the past 28 years.

Washington Landings of Fish and Shellfish, 1963[1]

Item	Quantity	Ex-Vessel Value
	Pounds	Dollars
Food fish:		
Salmon	53,756,307	11,759,000
Bottomfish	46,668,537	2,887,600
Other food fish (including halibut)	26,283,997	5,309,000
Industrial fish	4,297,094	27,000
Shellfish	16,910,296	3,044,400
Total	147,916,231	23,027,000

1/Preliminary.

High production was recorded in the commercial net fishery for salmon in the southern area of Puget Sound. However, in the northern areas--Port Susan, Port Gardiner, and Skagit-Bellingham-Samish Bays--the chum salmon fishery was a complete failure. Sockeye salmon landings of 7.9 million pounds were good only because United States fishermen were able to catch more than their usual share of the run while Canadian fishermen were tied-up by a labor dispute.

Bottomfish landings of 46.7 million pounds were second only to the record production of 49.0 million pounds in 1945. True cod came back strong in 1963 with landings of 6.2 million pounds. (True cod landings had declined from an average of 12 million pounds between 1954 and 1959, to 2 million and 3 million pounds in 1961 and 1962, respectively.) Ocean

perch landings of 15.5 million pounds were at a record level.

Carp landings were also noteworthy, increasing from a range of 200,000-300,000 pounds in 1957-1960 to 825,000 pounds in 1961, 1.2 million pounds in 1962 and 1963. Carp are taken from Moses Lake, Sprague Lake, and reservoir areas of eastern Washington. Virtually all of the carp catch is exported or reduced to fish meal.

The herring catch in 1963 was about average with landings of 6.9 million pounds for all uses--reduction, bait, and human consumption.

Shellfish landings of 16.9 million in 1963 were close to an all-time low due to a decline in the harvest of oysters, shrimp, and clams. (Washington Department of Fisheries, February 28, 1964.)

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SALMON CATCH BY SPORT FISHERMEN IN 1963:

Washington State sport fishermen enjoyed an estimated record catch of 1,130,308 salmon in 1963, with pink salmon predominating in the catch for the first time. The pink salmon catch of 437,000 fish was far above sport catches of that species in previous years. The sport catch of chinook and silver salmon was also high. The estimated silver salmon sport catch of 428,000 was second only to the record catch in 1957, and the 1963 chinook salmon sport catch of 265,000 was exceeded only in 1956 and 1957.

Fishing effort, which obviously has an important effect on catch, increased in 1963 to a total of 1,467,000 angler trips, a gain of 337,000 trips over the previous high established in 1962. Despite the high fishing intensity, the average catch per fisherman-day was 0.77 salmon, the best return to the sport fisherman since 1957.

In 1963, sport salmon catches out of Westport amounted to 173,791 fish, second only to the catch in 1962. Catches at the mouth of the Columbia River hit a record level (148,000 salmon), as did those at LaPush (22,852 salmon), and in the Strait of Juan de Fuca (229,142 salmon). In Puget Sound and the San Juan Islands the total catch of 555,723 salmon was the highest ever recorded in those areas due to the large catches of pink salmon.

Since the end of World War II there has been an accelerating trend toward private boat ownership, which has impaired a sport catch estimate system based partially upon reports from boathouses and rental boat agencies. As a result of the current trends, an order of the Washington State Director of Fisheries requires all sport salmon anglers, beginning in 1964, to carry, maintain, and return to the Department of Fisheries a free, nonlimiting punch card on which they will record their salmon catches. The new system will enumerate anglers for the first time and will yield needed information on freshwater salmon catches. (Washington State Department of Fisheries, March 6, 1964.)

Note: See Commercial Fisheries Review, June 1963 p. 52.

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FISHERY TECHNICIANS TO BE TRAINED AT PENINSULA COLLEGE:

Peninsula College in Port Angeles, Washington, is developing a two-year training program to prepare students as technicians for employment in fish hatcheries and fishery research laboratories. The first class is expected to start in September 1964. In addition to technical training, the course will include instruction in biology, chemistry, mathematics, English, and speech.

Peninsula College has been awarded a grant of $29,100 by the W. K. Kellogg Foundation to assist in the development of the fishery technician training program. In addition, the Port Angeles Chamber of Commerce will construct a fish pond at the college. The Washington State Department of Fisheries will provide fingerlings for the pond and assist in its management.

This grant represents one of a series of recent commitments by the philanthropic organization to further semiprofessional and technical education in community junior colleges.

Wholesale Prices

EDIBLE FISH AND SHELLFISH, MARCH 1964:

From February to March, prices were lower for nearly all of the major fishery products listed in the wholesale price index. The exceptions were higher prices for Great Lakes fresh-water fish because of increased demand during the Jewish holidays and some increase in prices for shucked oysters, fresh shrimp, and canned Maine sardines. The March 1964

Wholesale Average Prices and Indexes for Edible Fish and Shellfish, March 1964 with Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices 1/ ($)		Indexes (1957-59=100)			
			Mar. 1964	Feb. 1964	Mar. 1964	Feb. 1964	Jan. 1964	Mar. 1963
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					104.1	109.0	109.8	117.3
Fresh & Frozen Fishery Products:					105.5	113.2	113.0	123.0
Drawn, Dressed, or Whole Finfish:					100.9	120.8	116.5	121.2
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.08	.21	61.8	160.2	141.0	91.9
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.30	.31	89.2	90.2	96.1	122.2
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.82	.83	114.2	116.0	118.4	132.7
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.73	.58	108.2	85.8	69.4	100.7
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.70	.62	114.7	101.6	80.3	113.0
Processed, Fresh (Fish & Shellfish):					116.1	114.0	115.4	125.5
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.32	.58	77.7	140.8	142.0	94.7
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.97	.91	113.1	106.6	100.8	125.4
Oysters, shucked, standards	Norfolk	gal.	7.50	7.00	126.5	118.0	128.6	130.7
Processed, Frozen (Fish & Shellfish):					96.2	100.7	102.8	117.3
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.39	.39	98.9	98.9	98.9	97.6
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.37	.40	108.5	115.8	114.3	108.5
Ocean perch, lge., skins on 1-lb. pkg.	Boston	lb.	.33	.33	114.0	114.0	117.5	117.5
Shrimp, lge. (26-30 count), brown, 5-lb. pkg.	Chicago	lb.	.74	.77	87.2	91.3	95.5	123.4
Canned Fishery Products:					102.2	102.0	104.7	107.7
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	21.75	21.75	94.8	94.8	102.4	107.9
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.63	11.63	103.3	103.3	103.3	104.4
Mackerel, jack, Calif., No. 1 tall (15 oz.), 48 cans/cs.	Los Angeles	cs.	6.13	6.13	103.9	103.9	97.5	2/100.0
Sardines, Maine, keyless oil, 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	9.21	9.09	118.2	116.5	114.9	116.2

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.

2/ New product replaced California canned sardines starting December 1962; entered wholesale price index at 100 under revised procedures of Bureau of Labor Statistics.

Trawler with nets hung out for drying. This type of trawler is the mainstay of the New England food-fish industry.

wholesale price index for edible fish and shellfish (fresh, frozen, and canned) at 104.1 percent of the 1957-59 average was down 4.5 percent from the previous month. Compared with March 1963, prices this March were generally lower for most items with the overall index down 11.3 percent.

A marked 16.5-percent drop from February to March in the subgroup index for drawn, dressed, or whole finfish was the direct result of sharply lower ex-vessel prices at Boston for large haddock (down 61.4 percent). Prices for that species in February were very high because of extremely light haddock landings. Compared with the same month a year earlier, ex-vessel haddock prices this March were lower by 32.8 percent. The abrupt drop in haddock prices was partly offset by substantial increases in prices at Chicago for fresh Lake Superior whitefish (up 26.1 percent) for the Passover holiday trade, and a price rise at New York City for Great Lakes round yellow pike (up 12.9 percent). As compared with March 1963, the subgroup index was down 16.7 percent. Prices this March were lower than a year earlier for all items in the subgroup except fresh-water fish.

The subgroup index for processed fresh fish and shellfish in March 1964 was down only 1.8 percent from the previous month despite sharply lower prices for fresh haddock fillets (down 44.8 percent) at Boston. Compared with the same month in 1963, fresh haddock fillet prices were lower by 18.0 percent. From February to March, fresh shrimp prices at New York City rose 6.1 percent and prices for standard shucked oysters at Norfolk were up 7.2 percent. Prices this March for all items in the subgroup were below those of March 1963 and the index was down 7.5 percent.

From February to March, lower prices for frozen haddock fillets (down 6.3 percent) and a decline in prices for frozen shrimp (down 3 cents a pound) at Chicago were responsible for a 4.5-percent drop in the subgroup index for processed frozen fish and shellfish. March 1964 prices for other frozen fillets were unchanged from a month earlier. As compared with March 1963, the subgroup index this March was down 18.0 percent largely because of lower frozen shrimp prices and lower prices for ocean perch fillets.

March 1964 prices for most canned fishery products were unchanged from the previous month, but canned Maine sardine prices were up 1.5 percent. Those higher prices moved the subgroup index up 0.2 percent from February to March. But compared with March 1963, the index was down 5.1 percent. Prices this March were lower for canned Alaska pink salmon (down 12.1 percent) and canned tuna prices were slightly below those of the same month a year earlier. Prices for canned Maine sardines were a little higher than in March 1963 when stocks were higher than they had been for some time.

Wisconsin

FISHERY LANDINGS, 1963:

Total landings of fish at Wisconsin ports of Lake Superior and Lake Michigan (including Green Bay) in 1963 amounted to 16.2 million pounds--1.8 million pounds or 15 percent below landings for the previous year, according to data released by the U. S. Bureau of Commercial Fisheries.

Considerably less chubs (down 28 percent) and lake herring (down 58 percent) were landed in 1963 than in 1962, but there was some increase in the landings of alewives, and yellow perch landings were up 18 percent from the previous year. The 1963 landings of the more valuable species were lower than the previous year--whitefish was down 20 percent, and lake trout landings at Lake Superior were only about one-third those of the previous year because of restrictions placed on commercial fishing for that species.

Wisconsin fishing areas.

Landings in Wisconsin during 1963 from Lake Michigan accounted for 9.9 million pounds, Green Bay 3.8 million pounds, and Lake Superior 2.6 million pounds.

Four species of fish comprised 84 percent of the 1963 landings. They were chubs 35 percent; alewives 22 percent; yellow perch 20 percent; and lake herring 6 percent. The remainder was mostly carp and lake smelt.

HOW FAST DO FISH SWIM

How fast do fish really swim? Until recently 60 m.p.h. was thought reasonable for a really fast fish, but experiments at Aberdeen Research Laboratory, Scotland, and Cambridge University with fresh-water fish, show that they do not swim at such high speeds.

So far the highest accurately recorded speed is 27 m.p.h. for four feet for a barracuda in American waters. The speed was measured by a piscatometer--an instrument made from a fishing line fitted with accurate gauges to measure the tension on the line, and the speed at which it runs out.

International

FISHING LIMITS

MODIFIED 12-MILE FISHERIES LIMIT ACCEPTED BY 13 COUNTRIES AT EUROPEAN FISHERIES CONFERENCE IN LONDON:

A new "6-plus-6" fisheries convention has been signed by 13 of the 16 countries attending the European Fisheries Conference in London.

The new convention provides for an exclusive 6-mile fishery limit with an additional 6-12 mile zone open only by agreement to certain foreign fishermen with traditional fishing claims.

The new convention will be of unlimited duration, but contracting nations will have the right to withdraw after 20 years.

The 16 countries attending the conference were the 6 members of the European Economic Community (France, Germany, Italy, the Netherlands, Belgium, and Luxembourg), the 7 members of the European Free Trade Association (Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom), and also Iceland, Ireland, and Spain. The 3 countries which did not sign the new fisheries convention were Iceland, Switzerland, and Norway.

The conference also adopted resolutions on conservation, fisheries policing, and access to markets for fish. (EFTA Reporter, March 5, 1964.)

FISH MEAL

FISH MEAL PRODUCTION AND EXPORTS FOR SELECTED COUNTRIES, JANUARY-DECEMBER 1963:

Member countries of the Fish Meal Exporters' Organization (FEO) account for about 90 percent of world exports of fish meal. The FEO countries are Angola, Iceland, Norway, Peru, and South Africa/South-West Africa. Exports of fish meal by FEO countries during 1963 were up 11.7 percent while their total production was up 4.9 percent from that in the previous year.

Table 1 - Exports of Fish Meal by Member Countries of the FEO, January-December 1963

Country	December		Jan.-Dec.	
	1963	1962	1963	1962
	. . . (1,000 Metric Tons) . . .			
Angola	7.0	3.9	30.1	32.6
Iceland	17.6	7.5	99.1	70.9
Norway	19.1	10.4	103.6	61.7
Peru	104.7	107.6	1,159.4	1,066.0
So. Africa (including S.W. Africa)	13.4	11.3	198.4	192.9
Total	161.8	140.7	1,590.6	1,424.1

Table 2 - Production of Fish Meal by Member Countries of the FEO, January-December 1963

Country	December		Jan.-Dec.	
	1963	1962	1963	1962
	. . . (1,000 Metric Tons) . . .			
Angola	7.4	3.7	31.4	32.8
Iceland	8.7	2.2	87.8	96.1
Norway	9.6	4.6	131.7	120.9
Peru	139.7	155.9	1,159.2	1,120.8
So. Africa (including S. W. Africa)	1.2	-	238.2	201.2
Total	166.6	166.4	1,648.3	1,571.8

In 1963, Peru accounted for 72.9 percent of total fishmeal exports by FEO countries, followed by South Africa with 12.5 percent, Norway with 6.5 percent, Iceland with 6.2 percent, and Angola with 1.9 percent. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 18, 1964.)

FOOD AND AGRICULTURE ORGANIZATION

MODEL STANDARD FOR WORLD TRADE IN FISHERY PRODUCTS WORKED OUT BY FISHERIES GROUP:

A model standard and code of practices to cover fish and fish products in international trade has been worked out by an expert fisheries group of the Food and Agriculture Organization (FAO). It is the first time this had been done on an international basis.

The model standard is a result of the February 1964 meeting in Rome of 12 fisheries

International (Contd.):

experts from as many countries. It covers the definition and accurate description of fish and fish products important in world trade, quality requirements for such products, permissible additions to the products (salts, oils, preservatives, vegetables, or other food non-fish products), and marking and labeling requirements. The model standard is to be distributed by FAO to its 111 member nations. The meeting was held as part of the work being carried out under the Joint Food and Agriculture Organization/World Health Organization Codex Alimentarius Commission. The model will go as a working document to the FAO Commission's next meeting in Geneva in September 1964.

The fisheries group of experts also drew up a list of fish and fish products which should have priority for standardization. It includes 13 products--herring and sardine canned in oil or tomato sauce, tuna, bonito and mackerel canned in oil or brine, canned Pacific salmon, canned crab meat, canned shrimp, frozen tuna, frozen herring, frozen Pacific salmon, frozen crustaceans (such as shrimp, lobster, crab, etc), salted herring and salted cod.

In 1957, 1 out of every 4 tons of fish landed was exported, in one form or another. In 1961, that ratio had grown to 1 out of 3. It is believed to be even higher now.

The experts noted that each major fishing country already had established food laws, regulations and quality standards for its products. The job now facing world fisheries is to mold these into a commonly-accepted international instrument. (Food and Agriculture Organization press release, Rome, February 21, 1964.)

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CARIBBEAN FISHERIES DEVELOPMENT PROJECT:

The Food and Agriculture Organization on March 13, 1964, announced the appointment of a fisheries expert (Harry C. Winsor of St. John's, Newfoundland, Canada), as manager-designate for a United Nations Special Fund fisheries project in the Caribbean region. The expert was scheduled to arrive in the Caribbean in mid-April for a first round of discussions with participating governments. For this purpose he was to make his temporary headquarters at the U. N. office in Port of Spain, Trinidad. His permanent headquarters is yet to be determined. The 4-year Special Fund project is designed to provide, through exploratory fishing, market studies, and demonstration and training, a basis for fisheries development in Caribbean countries. The cost of the project to the Special Fund will be $1,558,500. The Caribbean nations and territories participating will contribute $712,800 in cash plus a wide range of local services.

The project is expected to cover the Dominican Republic, Haiti, Trinidad and Tobago, French Guiana, Guadalupe, Martinique, Surinam and the Netherlands Antilles, British Guiana, Barbados and the Leeward Islands, and Puerto Rico. (Food and Agriculture Organization, Rome, March 13, 1964.)

GENERAL AGREEMENT ON TARIFFS AND TRADE

21ST SESSION HELD AT GENEVA:

An assessment of progress made in the General Agreement on Tariffs and Trade (GATT) Program for the Expansion of International Trade since the 1963 Ministerial meeting was to be the major topic at the 21st Session of the Contracting Parties to the GATT meeting at Geneva, February 24 to March 20, 1964. At the meeting, the Contracting Parties were to consider an agenda of more than 50 items.

Under that topic the Contracting Parties were to review preparations of the Trade Negotiations Committee for the forthcoming Kennedy Round of tariff negotiations and developments in the intensive efforts under way to remove existing barriers to the export trade of less developed countries and seek out positive measures by which such trade can be expanded. In the context of new positive measures the session was to hear a report by an expert group recommending GATT activity in the field of trade information and trade promotion advisory services, and a report of a special committee which has been examining proposals for a new chapter of the GATT which would more clearly reflect the responsibilities and functions of the Contracting Parties with respect to the trade and development needs of the less developed countries.

Developments in the various regional economic groupings were also to be discussed. The European Economic Community (EEC) was expected to present its recent agreements with Turkey and the Associated Overseas

International (Contd.):

Countries to the Contracting Parties, as well as a report on other activities in the Community. Other groupings to report included the Latin American Free Trade Association, the Central American Common Market, and the Equatorial Customs Union.

Since the last GATT Session in 1962, some 20 countries have adhered to the GATT, bringing total membership now to 61. The Contracting Parties will confirm these recent accessions and also consider the applications for provisional accession of Iceland and possibly Viet-Nam.

The efforts in the GATT to remove quantitative restrictions, which have been increasingly successful, were to be continued at the 21st Session. Notification and examination procedures for those remaining restrictions inconsistent with GATT provisions were to be scrutinized and reports to be reviewed on consultations held during the past year with those countries which still maintain, consistent with the GATT, restrictions for balance-of-payments reasons.

The GATT is the basic international instrument guiding commercial relations among the nations of the world. The provisions of the GATT are designed to expand international trade and thereby to raise living standards, increase productive employment, and utilize more fully the resources of the world. The meeting of the Contracting Parties provides an international forum to discuss trade policy problems and to resolve trade difficulties in a manner conducive to the growth rather than the reduction of trade levels.

Note: See Commercial Fisheries Review, January 1963 p. 68.

INTER-AMERICAN TROPICAL TUNA COMMISSION

LOWER 1964 QUOTA RECOMMENDED FOR YELLOWFIN TUNA CAUGHT IN EASTERN PACIFIC:

A 1964 catch-limit (quota) of 77,000 tons of yellowfin tuna from the eastern tropical Pacific was recommended to member governments by the Inter-American Tropical Tuna Commission (United States, Costa Rica, Ecuador, Panama, and Mexico) at its 16th annual meeting in San Diego, Calif., March 18-19, 1964. This is 4,000 tons below the present estimated sustainable yield of about 81,000 tons. The lower quota for 1964 represents the first significant step the Commission has taken toward rebuilding yellowfin tuna stocks to their maximum productive level of about 91,000 tons.

At the meeting, the Commission's staff had suggested a quota of 74,000 tons aimed at bringing the resource back to full productivity quickly. The Commission felt that economic and other factors needed to be considered and therefore recommended the 77,000-ton quota.

The meeting was attended by delegations from Costa Rica, Ecuador, Mexico, and the United States. Mexico, which was represented for the first time, had a three-man delegation. The fifth member of the Commission, Panama, was represented by an observer from the Los Angeles (Calif.), Panamanian Consulate.

An Intergovernmental meeting on Yellowfin Tuna Conservation was held the following day, March 20, in order to obtain an agreement on the mechanics for enforcing the Commission's recommendations. The governments with voting power (Costa Rica, Mexico, Ecuador, Japan, and the United States) agreed that they were prepared to put regulations into effect when all nations fishing the resource on a meaningful scale agree to put into force adequate conservation measures. United States regulations will not be effective until all nations fishing on a meaningful scale have agreed to regulate their yellowfin tuna fishery.

At the April 1963 meeting of the Commission held in Panama, Republic of Panama, a catch quota of 81,000 tons was established, but with a provision for the reservation of 2,000 tons of the yellowfin tuna quota for allowance for incidental catches when fishing for other species, such as skipjack and bigeyed tuna, after the closure of unrestricted fishing for yellowfin tuna.

Note: See Commercial Fisheries Review, June 1963 p. 55.

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MEXICO JOINS INTERNATIONAL TUNA GROUP:

On January 29, 1964, Mexico deposited adherence, becoming effective February 29, 1964, to the Convention for the establishment of an Inter-American Tropical Tuna Commission, which entered into force March 3, 1950. The other members of the Commission are the United States, Costa Rica, Ecuador, and Panama. (Bulletin, U. S. Department of State, February 17, 1964.)

International (Contd.):

INTERNATIONAL CONVENTION FOR THE NORTHWEST ATLANTIC FISHERIES

CANADA RATIFIES PROTOCOL AMENDMENT CONCERNING HARP AND HOOD SEALS:

On January 23, 1964, Canada deposited ratification of a Protocol to the International Convention for the Northwest Atlantic Fisheries. The Protocol (done at Washington July 15, 1963) relates to harp and hood seals and is intended to bring those species within the responsibility of the Northwest Atlantic Fisheries Commission. As of February 1964, the Protocol was not in force. (Bulletin, U.S. Department of State, February 10, 1964.)

Note: See Commercial Fisheries Review, March 1964 p. 45.

INTERNATIONAL NORTHWEST PACIFIC FISHERIES COMMISSION

JAPAN-SOVIET FISHERIES CONFERENCE OPENED IN MOSCOW ON MARCH 2, 1964:

The International Northwest Pacific Fisheries Commission (Soviet Union and Japan) scheduled a series of meetings which began on March 2, 1964, in Moscow. The Commission sets the annual Soviet and Japanese catch quotas for salmon and king crab in the Northwest Pacific Ocean.

The Japanese delegation to the Moscow negotiations was headed by the Vice President of the Japan Fisheries Association and included senior officials from the Ministry of Foreign Affairs and the Fishery Agency. Attending as advisors were representatives from leading Japanese fisheries companies and fisheries associations and a representative from the Hokkaido Prefectural Government. (Fisheries Attache, United States, Embassy, Tokyo, February 12, 1964.)

INTERNATIONAL PACIFIC HALIBUT COMMISSION

BERING SEA HALIBUT CATCH IN AREA 3B NORTH TRIANGLE, MARCH 28, 1964:

The total halibut catch by United States, Canadian, and Japanese vessels fishing in Area 3B North Triangle in the Bering Sea was estimated at 750,000 pounds through March 28, 1964, by the International Pacific Halibut Commission (IPHC). Approximately 36 United States vessels, 28 Canadian vessels, and not more than 7 Japanese vessels began fishing in Area 3B North Triangle when it opened March 25, 1964.

Fishing weather in the first days of the season was very good and the Alaskan earthquake did not affect the fleet, or shore facilities at Sand Point, Alaska. However, the catch rate was said to be unsatisfactory from an economic standpoint for Canadian and United States vessels, which can only stay on the grounds about 12 days before having to depart for landing ports with their catches. The IPHC considers that the area's catch limit of 6,393,340 pounds will not be attained for a considerable period of time.

The number of Japanese vessels expected to operate in the area during the first month was 7, but it appears that some of those vessels may have been delayed since the maximum number of Japanese vessels making landings on any day was 3.

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NORTH PACIFIC HALIBUT REGULATIONS FOR 1964:

Fishing for halibut began May 1 at 6 p.m. in all North Pacific areas (Areas 1, 2, and 3A) except in the Bering Sea (Area 3B North and Area 3B North Triangle) and waters west of Area 3A, not including the Bering Sea (Area 3B South), according to the recommendation of the International Pacific Halibut Commission to the Governments of the United States and Canada for the 1964 fishing season. The regulations this year contain several important changes from 1963.

March 25 was the opening date for fishing in Area 3B North and Area 3B North Triangle. The opening date for fishing in Area 3B South was April 6. This year fishing in Areas 1, 2, and 3A began 8 days earlier than the opening date of May 9 last year. Area 3B North was opened to fishing on March 25 last year, the same as this year, but Area 3B South opened April 19 last year, 13 days later than the opening date this year.

The opening and closing hours of the various regulatory areas shall be 6 p.m. Pacific Standard Time of the date indicated, except in Areas 3B North Triangle and 3B North where it shall be 6 p.m. local time.

Fishing areas shall be: Area 1--south of Willapa Bay, Washington; Area 2--between Willapa Bay and Cape Spencer, Alaska; Area 3A--between Cape Spencer and Shumagin Islands; Area 3B South--waters west of Area 3A, not including Bering Sea; Area 3B North Triangle--waters between a line from Unimak Pass to the Pribilof Islands, north of the Aleutian Islands and east of 170° W. longitude; Area 3B North--waters in Bering Sea outside of Area 3B North Triangle.

In Area 1 the fishing season, without catch limit, shall terminate at the same time as that in Area 2. (Last year Area 1 was open to fishing to November 30 or the date on which Area 2 closed.)

In Area 2 the fishing season shall terminate at the time of attainment of the catch limit of 25 million pounds or on September 15, whichever is earlier. This is 3 million pounds less than last year's quota of 28 million pounds. The catch limit in Area 2 in 1963 was not attained by November 30 when the season ended. As of October 17, the Area 2 catch was 25.6 million pounds.

In Area 3A the fishing season shall terminate at the time of attainment of a catch limit of 34 million pounds or on October 15, whichever is earlier. There is no change in the catch limit which is the same as last year (in 1963 Area 3A closed on August 9).

International (Contd.):

In Area 3B South the fishing season shall terminate at the time of attainment of a catch limit of 4 million pounds or on October 15, whichever is earlier (the closing date last year was October 15 with no catch limit).

In Area 3B North the fishing season, without catch limit, shall terminate on October 15 (the closing date last year was October 15).

In Area 3B North Triangle the fishing season shall terminate at time of attainment of a catch limit of 6,393,340 pounds or on October 15, whichever is earlier. This catch limit is to be shared between Canada, the United States, and Japan, and its administration will involve a system of daily reporting of the amount and location of catches to the Commission by the fleet. Last year the quota for Area 3B North Triangle was 11 million pounds but the area closed on October 15 when 10,944,000 pounds had been taken by the three nations (Canada 4,058,000 pounds, United States 3,216,000 pounds, and Japan 3,670,000 pounds).

In 1963 the Pacific halibut fishery regulations were revised effective June 8, 1963. The revised regulations superseded those which became effective on March 21, 1963, and were concerned primarily with division of Area 3B North into two areas described as Area 3B North and Area 3B North Triangle. There also were other changes made in wording and in the description of the regulatory areas.

The Commission in 1964 will provide 10 days notice of closure of Areas 1 and 2, and 18 days notice of the closure of Area 3B and Area 3B South.

The Commission's recommendations for the 1964 season were announced on January 30 at the conclusion of its fortieth annual meeting at Seattle, Wash., with Chairman William A. Sprules of Ottawa, Ont., presiding.

The Halibut Commission is responsible to Canada and the United States for the investigation and regulation of the halibut fishery of the northern Pacific Ocean and Bering Sea. Its specific function is the development of the stocks of halibut to levels that will permit the maximum sustained yield, and its decisions regarding regulation are based upon the findings of its scientific staff.

During the past 32 years of Commission management, there has been progressive improvement of the stocks and increase in annual yield. The annual catch, which had declined to 44 million pounds in 1931 (the year before regulation), has averaged 72 million pounds during the past five years. The 1963 catch amounted to 71.2 million pounds, down nearly 4 million pounds from the previous year, but does not include the 3.7 million pounds taken by Japanese fishermen in Area 3B North Triangle. The 1963 halibut catch by United States fishermen amounted to 34.2 million pounds, or 6 million pounds less than in 1962 while the Canadian catch of 37 million pounds was 2 million pounds more.

The Commission reviewed the past year's fishery and the research conducted by its scientific staff. It also dealt with administrative matters and approved a research program for 1964. In the course of its sessions the Commission conferred not only with its staff, but also with representatives of the halibut fishermen's, vessel owners' and dealers' organizations. The scientific findings and all suggestions for regulations in 1964 were discussed at meetings.

The Commission announced also that the 1965 annual meeting will take place at Vancouver, British Columbia, Canada. The date was not specified.

Since in the past the United States and Canadian Governments have accepted the recommendations of the Commission without changes, it is fairly certain the 1964 regulations as recommended by the Commission will be approved by the two Governments.

INTERNATIONAL SEAWEED SYMPOSIUM

FIFTH MEETING TO BE HELD IN AUGUST 1965 IN HALIFAX, CANADA:

The Vth International Seaweed Symposium will be held in Halifax, Canada, from August 25 to 28, 1965. Previous symposia have been held in Edinburgh, Scotland (1952); Trondheim, Norway (1955); Galway, Ireland (1958); and Biarritz, France (1961). The invitation for 1965 was extended by the National Research Council of Canada, the Nova Scotia Research Foundation, and Dalhousie University. It has been accepted by the International Advisory Committee of the Symposium.

The symposium is open to all those who are interested in seaweeds and particularly in the problems associated with their proper utilization and conservation. There will be two classes of membership, regular and associate.

In order to give greater unity to the program, it is hoped that original papers can be grouped within the following broad divisions: ecology, taxonomy, physiology (including studies of growth), carbohydrates, non-carbohydrate constituents, metabolism algae as food, agricultural applications, and manufacture of algal extracts.

There will be no official language but it is desirable that papers should be read in either English or French.

There will be a post-conference excursion from August 29 to 31 to the prolific beds of seaweed in southwestern Nova Scotia around Digby.

Additional information about the symposium may be obtained by writing to The Secretariat, V International Seaweed Symposium, National Research Council Laboratories, 1411 Oxford Street, Halifax, Nova Scotia, Canada.

NORTH PACIFIC FUR SEAL CONVENTION

PROTOCOL AMENDING INTERIM CONVENTION RATIFIED BY UNITED STATES:

On February 6, 1964, the United States deposited ratification of the Protocol amending the interim convention of February 7, 1957, on conservation of North Pacific fur seals. (The ratification was signed by the President of the United States on the same day it was

International (Contd.):

deposited.) The Protocol, which was done at Washington, D. C., October 8, 1963, was not in force at the time of United States ratification. (Bulletin, the U. S. Department of State, March 16, 1964.)

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT

NINTH MEETING OF FISHERIES COMMITTEE:

The Ninth Meeting of the Fisheries Committee of the Organization for Economic Cooperation and Development (OECD) was held in Paris, France, February 10-12, 1964. Representatives from 17 member countries participated in the meeting, as well as from the European Economic Community (EEC), Food and Agriculture Organization (FAO), and the Council for Europe.

Significant agenda items for this meeting included (1) an examination of the different subsidies and other financial support to the fishing industries of member countries, (2) study of general services rendered to the fishery industry, (3) study of price systems, (4) study of the influence of recent changes in customs duties for fishery products, and (5) a review of the operational program for 1963 and 1964.

The report on the examination of the different subsidies and other financial support to the fishing industries of member countries was discussed in detail, country-by-country, and statements by a number of the member countries were accepted without comments or only with clarifying comments or minor revisions. The Secretariat announced that each country would be given a final draft of its chaper for a quick review. Later, the completed report would be submitted to the Chairman and Vice-Chairman for a final review before its submission to the OECD Council for approval.

The report classifies the various subsidies and financial supports of the individual member countries and recommends that certain measures harmful to trade should be progressively eliminated according to "reasonable" timetables. The Fisheries Committee urged the designation of an early beginning date for the abolition of certain subsidies in conformity with the timetables. The submission of this report to the Council for final adoption comes after a long period of debate and marks a significant step in providing data and recommendations for achieving international cooperation in the fields of national fishery subsidies and financial support.

It was recommended that the draft study on general services to the fishery industries follow a report on Germany but with less detail. On the study on price systems, the Committee favored the line followed in the report on Germany, but suggested information might be added on fees or costs involved.

It was also recommended that the study on the influence of recent changes in customs duties for fishery products should be limited to fresh and frozen fillets, fresh and salted herring, and canned fish in the Common Market countries. The United States request for the addition of fish meal and fish oil was recorded for future consideration. Belgium asked that a study of European Free Trade Association (EFTA) duties be made.

The titles of projects listed under the operational program for 1964 follow:

1. Market Information Service.

2. Meeting of Technologists of Fish Processing.

3. Sanitary Regulations for Canned Fish.

4. Multilingual Nomenclature of Fishery Products.

5. Study of a Rational Exploitation of the Resources of the Sea.

6. Study of the Market for Pelagic Fish (Herring).

The study on Sanitary Regulations for Canned Fish will be guided by the results of a meeting of the Codex Alimentarius Committee of Experts on World-wide Standards for Fish and Fish Products, which was held in Rome, February 18-20, 1964.

The Fisheries Committee officers who served in 1963 were all unanimously re-elected to serve in 1964. The next meeting of the OECD Fisheries Committee is tentatively scheduled for the end of May 1964. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 24, 1964.)

Note: See Commercial Fisheries Review, August 1963 p. 76, May 1963 p. 54, February 1963 p. 62.

International (Contd.):

UNITED STATES-IRISH COOPERATION IN JOINT FISHERIES PROJECTS

The details of joint Irish-United States fisheries research and development projects which could lead to the establishment of an Irish deep-sea fishing industry were announced by the Chairman of the Irish Sea Fisheries Board at a press conference held in Dublin in January 1964. Under the project, a research vessel will be permanently loaned to the Irish Fisheries Division of the Department of Lands by the United States, for use in exploring the North Atlantic to discover new fishing grounds. There is some belief that a tuna resource exists in the North Atlantic in the path of the Gulf Stream.

The announcement followed a November 1963 visit to Ireland by Donald L. McKernan, Director of the U. S. Bureau of Commercial Fisheries, and his collaboration with Brendan O'Kelly, Chairman of the Irish Sea Fisheries Board, in the preparation of a basic report on United States and Irish cooperation in joint fisheries projects. In announcing the details of the project, the chairman said that a team of United States experts was expected to arrive in Ireland in April to begin work with personnel of the scientific section of the Irish Fisheries Division. He said that no real expansion of the Irish fishing industry could take place unless it was based on fuller research and development of the fish resources around their shores.

The chairman added that comprehensive research, however, required considerable capital investment and for that reason the joint cooperative effort in the North Atlantic was a practical approach to the problem and would be of immense benefit to both countries. It was pointed out that Irish and United States fishery problems were very similar and that both countries were anxious to improve the efficiency of their fisheries and to survey and research alternative fishery resources more fully.

In the surveys, special attention would be given to the expansion of shellfish fisheries.

Educational proposals were designed to supplement existing educational programs toward recruitment of young people in the fishing industry and the training of skippers. It was also mentioned that the credit facilities available to qualified applicants under the Irish Fisheries Board Marine Credit Plan were unequaled in any other Irish industry. (United States Embassy, Dublin, December 27, 1963, and January 10, 1964; The Fishing News, January 17, 1964.)

Argentina

ATLANTIC FISHING GROUNDS OFF ARGENTINA WORKED BY ITALIAN FREEZER-TRAWLERS:

The Italian freezer-trawler Genepesca I fished off the coast of northern Argentina in June and July 1962 taking whiting, flounder, sea bream, corvina, and other groundfish in the Rio de la Plata area. The Captain of the vessel reported that fish stocks in the area appeared to be abundant, but that the fish caught differed somewhat from that usually consumed in Mediterranean areas. (Editor's Note: Other sources have reported that the convergence of the Antarctic Malvinas Current with the Equatorial Brazilian Current in an extensive continental shelf area off the Argentine coast between 38° and 44° south latitude creates favorable conditions for deep-sea trawling. International fisheries experts have estimated the annual possible yield of those waters at 3-3.5 million metric tons of fish per year.)

Italian vessels have fished off Argentina between 36° and 42° south latitude. They encountered regular depth variations and sandy bottoms which made trawl-net handling easy. They reported that on South American fishing grounds they preferred depths of 120 to 130 meters (394 to 426 feet) in winter, while in summer the most satisfactory trawling depth varied from 250 to 300 meters (820 to 984 feet). That was the main reason why they fished as far south as 42° latitude in summer, but stayed closer to 36° latitude in winter. (Alieia, January 1964.)

Note: See Commercial Fisheries Review, November 1963 p. 54.

Australia

AIR SHIPMENT OF ANESTHETIZED LIVE SPINY LOBSTERS CONSIDERED BY EXPORTERS:

The use of anesthetics to develop air shipments of live spiny lobsters to France is be-

Australia (Contd.):

ing explored by Australian exporters. Various anesthetics have long been employed to calm fish for experimental purposes, and this has led to anesthetics being used in air shipments of live fish, but it is believed that such methods have not been tried on shellfish.

One of the best known drugs in this field is tricaine methanosulfonate. Small fish and amphibians can be quieted by immersion in a solution of one gram of the compound in 1,000 cc. of water. For large sharks and rays, the solution is sprayed with a syringe or hand sprayer on the gills, and within a minute the fish may be handled safely.

Small fish can be shipped in sealed plastic bags of water and oxygen to which is added small amounts of anesthetic to produce a tranquillizing effect. Less oxygen is consumed and survival is higher. In Australia, anesthetics have been used successfully to transport fingerling trout in Victoria and mature brown trout in Tasmania.

Amyl alcohol, methylparafynol, chloral hydrate, and liquid quinaldine are other anesthetics that have been successfully used in the shipment of fish. (Australian Fisheries Newsletter, February 1964.)

Belgium-Luxembourg

IMPORT QUOTA AND DUTY FOR FRESH AND FROZEN COOKED CRAB AND SHRIMP, JANUARY 1, 1964-MARCH 31, 1965:

Belgian Ministerial Order of December 24, 1963 (Moniteur Belge, No. 12, January 16, 1964) set the annual combined quota for fresh or frozen crab and shrimp (Belgian Tariff No. ex 16.05 A). The 200 metric tons for calendar year 1963 was increased to 250 tons for the period January 1, 1964-March 31, 1965. Crab and shrimp, formerly duty free under the old quota, will be subject to an import duty of 3 percent ad valorem under the new quota. The quota applies to imports from both EEC countries and non-EEC countries. Goods entering under a tariff quota may not be re-exported from the Belgo-Luxembourg Economic Union in the condition in which they were imported.

The description of the goods as it appeared in the order is: "crabs of the varieties (king; 'kanasaki' and 'kegani' and shrimps of the variety 'Pandalus platiceros japonicus,' simply boiled and peeled or decorticated, including frozen intended for the canning and bottling industry." (Board of Trade Journal, February 7, 1964.)

Canada

FISHERIES MINISTER COMMENTS ON PROPOSED 12-MILE FISHERIES LIMITS:

A question was asked in the Canadian House of Commons on March 13, 1964, concerning the proposed extension of Canadian fisheries limits to 12 miles on May 15, 1964. The question asked, in part, was: "...Since it is the Minister's intention to unilaterally extend Canada's fishing limits to 12 miles on May 15, will he tell the House what steps are being taken to prevent any retaliatory action by the United States that would be detrimental to Canada's fishing industry?" In response, the Canadian Minister of Fisheries said, "Mr. Speaker, in reply I wish to say that there is no indication whatsoever that any measures of retaliation will be taken by the United States." (United States Embassy, Ottawa, March 19, 1964.)

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JOINT CANADIAN-JAPANESE FISHERY BASE IN NEWFOUNDLAND PROPOSED:

One of Japan's largest fishing companies is interested in establishing a joint Japanese-Canadian fishing and processing base in Newfoundland. The company is said to be negotiating with Canadian interests for the establishment of such an enterprise. Under consideration is a plan to base at Newfoundland about seven 300- to 500-ton trawlers which would supply fish to a shore-based processing plant. (Suisan Tsushin, March 5, 1964.)

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TRADE MISSION EXPLORES LATIN AMERICAN MARKET FOR FISH-PROCESSING EQUIPMENT:

On February 25, 1964, six Canadian engineers began a month-long tour of Latin America, with visits scheduled in Mexico, Ecuador,

Canada (Contd.):

Peru, and Chile. The tour, which was sponsored by the Canadian Department of Trade and Commerce, was designed primarily to investigate potential markets for Canadian-designed fish-processing equipment. The Mission was made up of 4 representatives of consulting engineering firms, 1 representative of an equipment manufacturing firm, and an engineer from the Canadian Department of Trade and Commerce, who acted as Mission Secretary.

Four of the five companies represented on the Mission belong to the Canadian Food and Fish Plant Consortium, a business affiliation of some 20 engineering and machinery manufacturing firms, which was formed in late 1963. The Consortium's objective is to pool resources for more effective development of export business. Its membership can offer a full range services and facilities from design and economic studies to the provision of all the specialized machinery employed in food- and fish-processing plants. (Canadian Department of Trade and Commerce, Ottawa, February 24, 1964.)

Cape Verde Islands

JAPANESE TUNA BASE TO BE CONSTRUCTED:

A Japanese trading firm and the Kanagawa Tuna Fishermen's Cooperative Association, together with a United States tuna-canning firm, are expected to enter into a formal agreement with a firm in the Cape Verde Islands (Portuguese) to establish a tuna base at Porto Grande, Sao Vicente Island. The Cape Verde firm presently operates a 720-ton capacity cold-storage plant. Under the joint partnership agreement, the holding capacity of that plant will be increased to 3,000 tons, and medical and maintenance facilities will also be constructed.

The Kanagawa Association plans to assign a fleet of 20 tuna long-liners to the Cape Verde base as soon as the base facilities are completed. The catch will be transshipped to the United States firm's tuna plant in Puerto Rico. (Suisan Tsushin, February 27, 1964.)

Chile

JOINT TUNA ENTERPRISE WITH JAPAN:

The Production Development Corporation of Chile (CORFO) has approached a Japanese fishing company to establish a joint tuna-fishing enterprise in Chile. The Japanese firm (which is conducting a joint resource investigation with Chile on centolla crabs off southern Chile) has not yet determined the feasibility of CORFO's proposal.

Informed sources in the Japanese Fisheries Agency feel that there may be problems regarding the establishment of such an enterprise, since Chile claims a 200-mile territorial sea limit. (Suisancho Nippo, March 13, 1964.)

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NEW FISH-MEAL FACTORY AT IQUIQUE DEDICATED:

The large new fish-meal factory built at Iquique, Chile, as a joint Chilean-South African venture was officially dedicated in November 1963. In an address by the president of the fish-meal factory, he emphasized that it was an example of how Chileans and foreigners could work together and how important it was for Chile to expand its industries in order to provide foreign exchange.

In another speech, the representative of the President of Chile spoke of the past greatness and collapse of Chile's nitrate era, and that recent developments together with new government legislation made it possible to provide the incentives for attracting the national and foreign capital necessary for the development of Iquique's (Province of Tarapaca) natural resources. One of the incentives was making the area a free industrial zone.

The new factory at Iquique is said to be in many ways an extension to the west coast of South America of techniques and equipment evolved by the fish-meal industry of South and South-West Africa. The joint venture had its inception in late 1962 when South African capital was invested to build a fish-meal factory in Chile. About that time, engineers and building contractors from South Africa went to Chile to build the factory, as well as fishing vessel captains and vessel engineers who also went there to fish for the new factory. (The South African Shipping News and Fishing Industry Review, December 1963.)

Note: See Commercial Fisheries Review, January 1963 p. 115.

Denmark

"CAVIAR" PLANT PLANNED FOR NORTHERN GERMANY:

A large Danish fish-processing company in Glyngøre, Denmark, plans to establish a fish-processing plant in northern Germany to produce Danish "caviar" for German, Belgian, and other European Common Market country markets. The caviar is produced from "lumpsuckers" or lumpfish (Cyclopteridae) and is a significant Danish export item. In 1963, Denmark's total exports of that type of "caviar" amounted to 264 metric tons valued at 3,009,946 kroner (US$436,400). The planned construction in Germany makes it easier to meet strict German regulations on the processing of that semipreserved product and also many mean that Denmark's entry into the Common Market is not expected to occur very soon. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 4, 1964.)

Faroe Islands

FISHING LIMIT OF 12 MILES STIRS REACTIONS:

The Faroese fishing limit of 12 nautical miles came into effect March 12, 1964, ending the fishing rights of British trawlers in the 6- to 12-mile zone around the Faroe Islands. The limit will also prevent Soviet fishermen from entering the Faroese 12-mile coastal zone to transfer catches.

The Faroese Lagting intends to make fishing limit violations more costly by increasing the minimum fine for illegal trawling from Kr. 10,000 (US$1,450) to Kr. 30,000 ($4,350). The catch and gear of vessels violating the limits will also be subject to confiscation. The patrol vessels available to watch for violations off the Faroe Islands include the Danish inspection vessels Ingolf and Vaedderen. Both vessels carry helicopters as well as advanced electronic systems for accurately determining their own position and those of fishing craft violating the limits.

British fishing organizations notified the Government of Denmark that Faroese landings of iced fish in British ports as well as Faroese shipments of frozen fish to Britain would be subject to quarterly quotas beginning April 1, 1964, as a result of the extension of Faroese fishing limits. It has been reported that the quotas will be set so that the value of current Faroese landings and shipments does not exceed the average value of those in the last 10 years. The annual quota would then be divided into quarterly limits of Kr. 5 million ($725,000) in the first and fourth quarters and Kr. 3.5 million ($507,500) in the second and third quarters. The value of the total quota for the year would be about one-third less than the value of average Faroese fishery exports to Great Britain during 1961-1963. The reduction in Faroese fishery exports to Britain actually may be much greater. Iced fish landings, which make up about 90 percent of the exports, are delivered mainly in the October and January quarters, and it has been reported that unused portions of the April and July quarterly quotas may not be transferred.

Faroese iced fish landings in British ports totaled about 19,400 metric tons in 1963, compared with 20,400 tons in 1962, and 21,900 tons in 1961. The probable course for the Faroese will be to land the quotas permitted in Great Britain. The remainder of the Faroese catch would then be landed in the Faroe Islands. Faroese fishermen are uncertain whether catch returns from landings in their home ports, including time and travel saved, would equal returns from landings in British ports.

Faroese processing interests would welcome the additional raw material. If salted fish prices remain high, part of the new supply would be salted, but it is more probable that the greatest effort would be devoted to processing fish fillets for sale in United States and Continental markets. Additional processing capacity would be required to handle most of the diverted catch. There could be some increase in hand filleting, but not much surplus mechanical filleting capacity is available. However, the Economic Committee of the Government of Denmark has approved a Kr. 3.6 million ($522,000) guarantee for the construction of a Kr. 4.3 million ($624,000) fish fillet-processing plant in Klaksvig (Faroe Islands), with an annual capacity of 3.3 million to 4.4 million pounds of fillets. The new plant would be able to process from 11.0 million to 13.2 million pounds of whole fish a year. Such a plant could possibly be completed late in 1964 when Faroese iced fish landings become substantial.

If about one-third ot the usual Faroese iced fish landings in Britain are diverted to the Faroe Islands, it will mean additional supplies

Faroe Islands (Contd.):

of about 15.5 million pounds of fish, mostly cod, will be available each year in the Faroe Islands to produce about 6 million pounds of fillets for United States and Continental markets. Because of the limitation on transferring unused quotas, still more fish might become available. However, limited fillet-processing capacity and high prices for salted cod might prevent all of the new supply being used to produce fillets.

United States imports of frozen fillets from the Faroe Islands increased from 1,159 tons valued at Kr. 3.8 million ($551,000) in 1961 to 1,602 tons valued at Kr. 5.0 million ($725,000) in 1962, and 2,725 tons valued at Kr. 8.7 million ($1.3 million) in 1963.

There have been reports that Danish processors might be interested in landings of Faroese fish but it remains only a possibility which may be considered later in the year.

Danish, Faroese, and British interests are reported to be preparing to establish a joint company to handle imports of Faroese fish into Grimsby, England, where it is thought the limitations on Faroese shipments may not be as restrictive. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 4 and 11, 1964.)

Note: Kroner (Danish) 6.90 equal US$1.00.

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FISHERIES TRENDS, 1963:

Catch: Despite the addition of 11 new fishing vessels in 1963, the Faroese fisheries catch in 1963 was 3 percent less than in 1962. A small increase in the herring catch was offset by a drop in the catch of cod and other fish (table 1).

Table 1 - Catch of Demersal Species and Herring by Faroese Vessels, 1962-1963

Year	Demersal Species[1]	Herring	Total
	(Metric Tons[2])		
1963	127,600	10,900	138,500
1962	133,655	9,855	143,520

1/Mostly cod, but also haddock, halibut, ling, plaice, saithe; tusk, porbeagle, Norway lobster, ocean perch (redfish), catfish, etc.
2/Round, fresh weight.

Processing: WET-SALTED FISH: Total production of wet-salted fish in 1963 was down 7 percent from 1962. Only the production on the Icelandic grounds showed an increase over the previous year (table 2).

Table 2 - Faroese Production of Salted Fish,[1] By Fishing Area, 1962-1963

Year	Fishing Area				Total
	Greenland	Iceland	Barents Sea	Faroe Islands	
	(Metric Tons)				
1963	[2]33,375	1,594	311	856	36,136
1962	35,319	1,360	1,069	1,023	38,771

1/Mostly cod. Does not include salted herring.
2/Includes production from fish taken off Newfoundland.

DRY-SALTED FISH: Production of dry salted fish in 1963 was estimated at 8,000 tons, or 27 percent less than the 10,872 tons produced in 1962.

SALTED HERRING: The production of salted herring in 1963 amounted to 85,000 export barrels. This was well above the 64,000 barrels of 1962, but well under the 112,000 barrels produced in 1961 and 159,000 barrels in 1956. The net weight of an export barrel of herring is 145,147 kilos (320-324 pounds).

FROZEN FILLETS: The production of frozen fillets in 1963 amounted to about 4,100 tons as compared with 2,700 tons in 1962. The 1963 total includes 860 tons of saithe (coalfish) fillets prepared for Hungary, East Germany, and Czechoslovakia. Nordafar, the Norwegian, Danish, and Faroese company operating at Faeringehavn, Greenland, produced about 2,100 tons of the 1963 total and about 1,600 tons of the 1962 quantity.

Exports: Faroese exports of fishery products in 1963 were up 8 percent in value from the previous year. (As usual, about 98 percent of total Faroese exports were fishery products.) Increases occurred only in wet-salted fish and frozen fillets (table 3).

Table 3 - Value of Total Faroese Exports of Fishery Products, 1962-1963

Commodity	1963		1962	
	Million Kroner	Million US$	Million Kroner	Million US$
Wet-salted fish[1]	53.2	7.7	35.6	5.2
Dry-salted fish[1]	31.5	4.6	36.0	5.2
Salted herring	11.7	1.7	15.8	2.3
Iced fish	19.4	2.8	22.1	3.2
Frozen fish fillets	11.9	1.7	7.8	1.1
Other fishery products	6.3	0.9	7.2	1.0
Total	134.0	19.4	124.5	18.0

1/Does not include herring.

Year-End Stocks of Fish on Hand: Larger quantities of all major fishery commodities, except dry-salted fish, were in storage in the Faroe Islands at the end of 1963 than at the end of 1962. Relatively higher values for the stocks on December 31, 1963, indicated higher unit prices were expected (table 4).

Faroe Islands (Contd.):

Table 4 - Year-End Stocks of Fish in the Faroe Islands, 1962-1963

Commodity	Dec. 31, 1963			Dec. 31, 1962		
	Qty.	Value		Qty.	Value	
	Metric Tons	1,000 Kr.	US$ 1,000	Metric Tons	1,000 Kr.	US$ 1,000
Wet-salted fish	3,600	10,000	1,449	2,492	3,300	478
Dry-salted fish	1,500	6,700	970	1,696	6,000	869
Salted herring	1,780	2,500	362	732	1,000	145
Fillets	155	500	72	125	300	43
Total . .	7,035	19,700	2,853	5,045	10,600	1,535

Fishing Vessels: During 1963, the Faroese fishing fleet gained 11 new fishing vessels, 3 of which were built in Faroese shipyards. In 1964, a total of 10 new fishing vessels are to be delivered. Five will have refrigerated cargo holds and one will be equipped with a power block for herring seining (table 5).

Table 5 - Faroese Fishing Vessels, By Tonnage Group, 1963

Gross Registered Tons	Number of Vessels	Total Tonnage
20-100	99	6,023
100-200	34	5,022
200-300	35	8,939
300-400	12	3,824
400-500	3	1,291
Above 500	12	9,523
Total	195	34,622

The trend in the Faroese fleet is toward steel long-liners and better equipped vessels. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, February 26, 1964.)

Note: Kroner (Danish) 6.90 equal US$1.00.

France

INDUSTRY URGED TO INCREASE EXPORTS OF CANNED TUNA:

At a meeting of France's Tuna Committee in January 1964, it was decided to promote greater exports of French canned tuna. The Committee also decided to contribute funds for the promotion effort.

The demand for canned tuna in France has been very good and markets were expanded considerably during the past three years. Recently, the demand dropped to such a low level on a national scale as to cause some concern, and fears were expressed that the national consumption potential of canned tuna may have been overestimated.

Stocks of canned (yellowfin) tuna from the previous season's pack were ample at the beginning of 1964. As of early January 1964, tuna fishing was well in progress, with indications that the season's quota would be reached by the end of May. Also, canned tuna was being imported by France in sufficiently large quantities to further depress the market. It was also pointed out at the meeting that increasingly large supplies of canned salmon were available--a product competitive to tuna and expected to become even more competitive.

At the Tuna Committee meeting, emphasis was placed on increasing exports and that an attempt be made by industry for a substantial initial export shipment of canned tuna. (Le Marin, January 24, 1964.)

Greece

LANDINGS BY ATLANTIC FREEZER-TRAWLER FLEET, 1963:

The Greek fleet of freezer-trawlers fishing in Atlantic waters landed 18,613 metric tons of frozen fish in 1963 compared with 16,979 tons in 1962 and 14,500 tons in 1961. In spite of a decline in average landings by individual freezer-trawlers in both 1962 and 1963, the addition of new vessels to the freezer-trawler fleet resulted in an increase in total landings. The Greek fleet of freezer-trawlers was expanded from 13 vessels in 1961 to 17 vessels in 1962 and 22 vessels in 1963. Taking into consideration that the new trawlers added each year did not all start fishing at the first of the year, the average annual landings of frozen fish per vessel were determined to be 1,180 tons in 1961, but only 1,095 tons in 1962, and 990 tons in 1963. The reduction in average landings by 105 tons from 1962 to 1963 was estimated to mean an average loss of revenue per vessel of over 1 million drachmas (US$33,333). The decline in average landings was said to be due to a drop in the catch off Mauritania in northwest Africa. (Alieia, January 1964.)

Notes: (1) Greek drachmas 30.00 equal US$1.00.
(2) See Commercial Fisheries Review, Dec. 1963 p. 63, April 1963 p. 52, Jan. 1963 p. 92.

Guatemala

SHRIMP INDUSTRY TRENDS IN CHAMPERICO:

The joint Guatemalan-Japanese fishing and fish processing venture located at Guatemala's Pacific Coast port of Champerico has 20 fishing vessels operating out of that port. Ten of the vessels are owned by the Guatemalan firm (owns and operates the packing plant) which is a party to the joint enterprise and the other 10 vessels are owned by a separate Guatemalan corporation (but with the same ownership as the Guatemalan firm party to the joint venture). The Guatemalan interests of the joint enterprise control 51 percent of the venture, and a Japanese fishing firm and a Japanese trading firm both control the remaining 49 percent.

In addition to their financial interest, the Japanese provide technical supervision for the entire operation and market the processed product. All of the fishing vessels are jointly manned by Japanese and Guatemalans. The Japanese hold the positions of captain and chief machinist, while the Guatemalans occupy the three lesser posts in the typical five-man vessel crew. Other Japanese personnel oversee the processing and administrative functions. The shrimp that are caught and processed are marketed in the United States by a large Japanese trading organization.

The fishing vessels normally make about one voyage every two weeks. The average biweekly catch appears to run between 5,000 and 7,000 pounds of heads-off shrimp per vessel, plus a few hundred pounds of finfish and spiny lobsters. It also appears that more fish than shrimp are actually caught, but they are not landed because of the relatively small local demand for finfish, nor can they be economically exported at this time. According to the Guatemalan company's officials, the greatest part of the shrimp catch is exported to the United States, with nearly 90 percent shipped to New York City, 5 percent to Miami, Fla., and the remaining 5 percent divided between other United States cities and the domestic market. The firm's representatives said that their shrimp were bringing good prices, according to size, on the New York City wholesale market and that prices f.o.b. Champerico ranged from 35 to 85 U.S. cents a pound. The frozen shrimp are usually shipped to the Atlantic Coast port of Matias de Galvez by refrigerated truck and from there transported to the United States by ship.

The packing plant at Champerico is modern and has extensive freezing, ice-making, and frozen cold-storage facilities. The shrimp arrive at the plant in the shell but headless, and are immediately sorted and sized by machine. Following the sizing operation, the shrimp are placed in boxes, weighed (five pounds is the standard unit), and sent to the packing section of the plant. The shrimp are then frozen and packed in 50-pound cartons for export.

The packing firm employs about 250 workers, including 40 Japanese. There are about 100 fishermen, and the remainder of the work force is engaged in fish processing. The only other major employer in Champerico is a Government-owned enterprise which operates all port services. The plant wage scales are comparable to wages paid in the food processing industry in Guatemala City despite the lower cost of living in the port city. The shrimp packers are paid on a piece-work basis and virtually all of the sorters and packers are women.

It was reported that the Guatemalan fishing firm has recently had its share of labor problems because of agitation to organize a union to consolidate labor operations of both the fishing firm's operations and those of the Champerico port authority. But the attempts to unionize failed.

Guatemala's Labor Ministry wishes to see the speedy replacement of Japanese personnel by Guatemalans on the fishing vessels, pointing out that the original agreement for the establishment of the company provides that the Japanese will train Guatemalans in all aspects of fishery operations. In this connection, the Ministry of Labor and the company jointly announced the establishment of a school to train Guatemalans as fishing vessel captains and machinists. The school will be in Champerico and was scheduled to open on March 1 with an initial enrollment of 7 students.

The wage scale for mariners aboard the firm's fishing vessels is computed on the basis of the vessel's total catch classified as fish, lobster and shrimp, with the shrimp further broken down by quality--best, good, and fair. The firm's accounting records showed that the winch operators earn about Q51.00 (US$51.00) a trip and the seamen about Q45.00 ($45.00) a trip. In addition, they receive their food at no cost while working on the fishing vessel. The Japanese crew members, the Captian and the Chief Machinist, also receive a salary, the amount of which was not disclosed.

The wage scale for plant employees is: dockworkers Q.20 (20 U.S. cents) an hour; sorters Q.20 (20 cents) an hour; cold storage Q.50 (50 cents) an hour; packers Q.005 (1/2 cent) per box packed. The operating hours of the plant depend on the size of the catch, and factory employees normally work several hours overtime. Time-and-a-half is paid for all overtime. (United States Embassy, Guatemala, March 6, 1964.)

Notes: (1) 1.00 Guatemalan quetzales equals US$1.00.
(2) See Commercial Fisheries Review, January 1964 p. 51; and May 1963 p. 64.

Iceland

HERRING PRICES, MARCH 1-JUNE 15, 1964:

The Icelandic State Fisheries Pricing Board has announced prices to be paid at processing plants for South and West Coast herring during March 1-June 15, 1964. Following is a comparison between 1964 and 1963 prices according to the utilization of the herring:

Utilization	Mar. 1-June 15, 1964		Mar. 1-June 15, 1963	
	I.Kr./Kilo	US¢/Lb.	I.Kr./Kilo	US¢/Lb.
Herring for salting	1.42	1.50	1.60	1.69
Herring for filleting	1.12	1.18	1.20	1.26
Iced herring for export	1.40	1.48	1.20	1.26
Herring fodder . . .	1.00	1.05	0.95	1.00
Frozen herring, 10 percent fat content (3-6 herring per kilo)	1.60	1.69	1.75	1.84
Herring for reduction	0.67	0.71	0.70	0.74

Note: Iceland kronur 43.06 equal US$1.00.

In 1964, prices were down for herring for salting and filleting, but the price of iced herring for export was above that in the previous year. (United States Embassy, Reykjavik, March 18, 1964.)

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FROZEN FISH SOLD TO U.S.S.R.:

The Freezing Plants Corporation and the Fisheries Department of the Federation of Iceland Cooperatives contracted in early 1964 to supply the Soviet Union with 12,000 metric tons of south coast frozen herring and 15,000

Iceland (Contd.):

tons of frozen fish fillets, including cod, haddock, ocean catfish, coalfish, ling, and ocean perch. The same amounts were sold to the Soviet Union by Iceland in 1963. The price which will be received in 1964 for the whitefish and ocean perch fillets is Ł154 per metric ton (US$0.195 per pound) compared to Ł149 per ton ($0.189 per pound) in 1963. The price which will be received in 1964 for the herring will be Ł53 per ton ($0.067 per pound), which is the same as the price in 1963. (United States Embassy, Reykjavik, March 4, 1964.)

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FISHERY LANDINGS BY PRINCIPAL SPECIES, JANUARY-AUGUST 1963:

Species	January-August	
	1963	1962
	(Metric Tons)	
Cod	211,219	203,456
Haddock	35,064	30,557
Saithe	10,481	9,586
Ling	4,630	5,756
Wolffish (catfish)	12,423	12,595
Cusk	4,922	4,107
Ocean perch	26,005	10,217
Halibut	832	1,060
Herring	284,861	382,235
Shrimp	349	349
Other	10,268	9,234
Total	601,054	669,152

Note: Converted to whole ungutted fish regardless of how landed.

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UTILIZATION OF FISHERY LANDINGS, JANUARY-AUGUST 1963:

How Utilized	January-August	
	1963	1962
	(Metric Tons)	
Herring1/ for:		
Canning	291	335
Oil and meal	188,673	301,201
Freezing	21,863	18,138
Salting	67,340	54,842
Fresh on ice	5,617	7,718
Groundfish2/ for:		
Fresh on ice	21,363	17,633
Freezing and filleting	141,785	132,118
Salting	68,354	84,070
Stockfish (dried unsalted)	66,971	39,418
Canning	35	-
Home consumption	9,910	9,069
Oil and meal	2,811	1,987
Capelin for:		
Freezing	188	-
Oil and meal	889	-
Shrimp for:		
Freezing	267	263
Canning	82	86
Lobsters for:		
Fresh on ice	2	-
Freezing	4,613	2,274
Total production	601,054	669,152

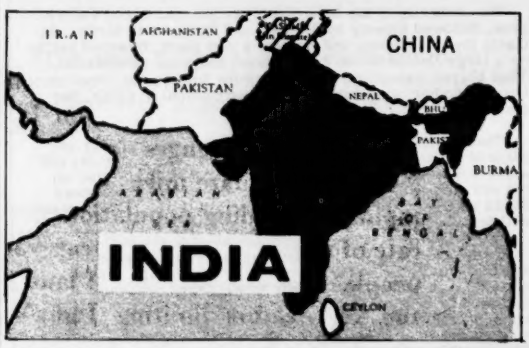
1/Whole fish.
2/Drawn fish.
Source: Aegir, December 15, 1963.

India

NEW SHRIMP-PROCESSING PLANT IN COCHIN:

The construction of a new fishery products processing and freezer plant on Vypeen Island, Cochin, Kerala, India, was completed in September 1963 and started operating in November. The new plant was built by a Cochin seafood firm in collaboration with a New York City fishery products marketing firm. The New York firm has agreed to buy the Cochin firm's entire exportable production of shrimp. The New York firm also financed the purchase of United States machinery and equipment for the freezing plant.

The plant is equipped with refrigerating machinery, tunnel, plate freezers, and other equipment used for freezing fishery products. It also has automatic washers, inspection belts, mechanical sorters and graders. Capable of handling about 100,000 pounds of shrimp a day, the plant has a storage capacity of over 40,000 pounds of packaged frozen fishery products, mostly shrimp. The Cochin company has set up a Diesel oil installation to supply fuel to the fishing vessels; built an ice plant with a 20-ton capacity to supply ice to the fishing vessels; and operates a fleet of insulated trucks.



The firm operates 60 small mechanized trawlers which deliver their shrimp catches to three processing centers located in different areas within 20 miles of the main plant. When the shrimp is delivered to the main plant, it is mechanically washed, sorted, graded, weighed, packed, frozen, and stored for shipment. In order to provide an adequate supply of fresh clean water for washing and cleaning the shrimp, the company has bored a deep tube well of 300 feet at the plant site.

The company's production department is staffed with a team of qualified fishery technologists who have had several years practical experience in the packaging of frozen fishery products. A qualified and foreign-trained refrigeration engineer is in charge of the plant's refrigeration department, with a team of experienced refrigeration mechanics working under him.

It is estimated that if the plant were to operate at optimum capacity for ten months out of the year it would achieve a production of about 12 million pounds with a foreign exchange value of Rs.50 million (US$10.4 million), making it the largest freezer plant in India. The company is reported to have applied for a license to import two large trawlers at a cost of about $85,000 each to carry out offshore and deep-sea trawling operations year-round.

India's exports of frozen shrimp from Cochin have increased greatly mainly because of the rich shrimp fishing grounds of the Cochin maritime area. Shrimp are normally caught in the area's coastal waters in about 6 to 10 fathoms by local vessels which operate up to a distance of 5 to 10 miles from shore. Different types of fishing gear are used for catching shrimp, the most widely used being the drag net. In the past five years, mechanized vessels and small trawlers have

India (Contd.):

been added to the local fleet which now numbers about 400. Cochin is regarded as the pioneer of India's frozen shrimp industry with more than 15 packers now operating in that area.

Italy

TUNA INDUSTRY TRENDS:

There are about 35 tuna canneries in Italy. They include plants which specialize in packing only tuna, as well as plants which pack other foodstuffs. Their combined daily processing capacity is estimated to total 380-400 metric tons of tuna.

The smaller plants can process daily about two metric tons of tuna, the medium plants about eight tons, and the large plants about 30 tons. Some of those plants are now reported to be expanding their production facilities.

The majority of the tuna plants are located in the Venice area, followed closely by Trapani and Palermo in Sicily. At Gaeta (between Rome and Naples) a new plant, financed partly by a large United States tuna packer, has been established. That United States firm is also helping finance the construction of another plant (now under construction) at Olbia, Sardinia.

The existing facilities at Olbia consist of a cannery capable of processing about five metric tons of tuna per day and a 300-ton capacity cold-storage plant. Upon completion of the new facilities, the packing plant will be able to process 20-30 metric tons of tuna per day, and the cold-storage plant will be able to hold 2,000 metric tons of frozen tuna.

Some of the Italian tuna plants operate their own cold-storage facilities. Their combined total cold-storage capacity is estimated at 7,000-8,000 metric tons. Other noncannery-operated cold-storage facilities (located mainly at the different seaports) utilized for holding tuna are estimated to have a combined total holding capacity of about 10,000 metric tons. The monthly cold-storage fees of those noncannery-operated plants range from 1,500-3,000 lira (US$2.41-4.83) per metric ton.

Italians do not like big-eyed tuna due to the dark color of the meat. However, they are purchasing big-eyed tuna in mixed lots with yellowfin, which they like most. They are said to be beginning to utilize big-eyed tuna more and more, although at a slow rate.

Italy imports frozen tuna principally from Japan and to a lesser extent from other countries, such as Norway, Spain, and Turkey. In 1961, Italy imported approximately 29,000 metric tons of Japanese frozen tuna, and in 1962 about 32,400 metric tons. From Norway Italy imported 3,000 metric tons of bluefin in 1961, and another 2,000 metric tons in 1962.

Small quantities of Spanish skipjack (averaging about five pounds each) are imported into Italy. However, they are reported as being inferior in quality to the Japanese product. In 1961, Italy imported about 2,000 metric tons of skipjack from Turkey and Peru, but due to their small size, lower yield, and the fluctuating nature of the skipjack fisheries in general, Italian packers are reported not to be placing too much reliance on those countries as sources of tuna supply. (Nihon Suisan Shimbun, January 1, 1964.)

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EXPANSION OF TUNA OPERATIONS PLANNED:

A large Italian commercial combine, through its subsidiary fishery firm, is reported to be planning on expanding its tuna operations and is desirous of working out an agreement with Japan. Reportedly, the Italian firm hopes to construct a 1,000- to 1,500-ton portable-boat-carrying tuna mothership. The crew for the mothership, as well as fishing gear, would be provided by Japan.

A Japanese fishing company has been approached, and that company, in turn, has submitted an application to the Japanese Fisheries Agency to participate in the Italian enterprise.

Reportedly, the Italian commercial combine is presently negotiating with the Italian Government for financial assistance to construct the tuna mothership, and the Italian combine plans to put up 30 percent of the construction cost and is seeking a low-interest loan for the remaining 70 percent. (Suisan Tsushin, February 6, 1964.)

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JOINT JAPANESE-ITALIAN TUNA ENTERPRISE PROPOSED:

A proposed joint Japanese-Italian tuna enterprise involves a Japanese company and is actually being supported by an Italian businessman with Swiss connections.

The joint enterprise is to be established with a capital of 100 million lira (US$161,000), with each participant contributing an equal share. In the initial year of operation, the Japanese firm would export to Italy one or two large tuna vessels, which would be operated by a Japanese crew. Eventually, the fleet would be expanded to 10 tuna vessels in the 1,000-ton class, which would be exported to Italy from Japan. (Suisancho Nippo, February 27, 1964.)

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PRICES PAID FOR JAPANESE FROZEN TUNA:

Japanese landings of Atlantic Ocean frozen tuna for export to Italy were reported to be averaging about 4,000 metric tons a month. Since the Italian tuna market is considered able to consume at the present time only about 40,000 metric tons of imported tuna annually, some concern is being expressed by Japanese trading firms over what presently appears to be an imbalance in supply and demand. Reportedly, this has resulted in a slight weakening of the Italian tuna market.

Italy (Contd.):

Towards mid-February 1964, the price of frozen yellowfin (dressed with tail) exported to Italy was holding at US$410 a metric ton c. & f., but dressed big-eyed was quoted at $340-360 per metric ton c. & f., down slightly. (Suisan Tsushin, February 22, 1964.)

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IMPORT CURBS BEING STUDIED:

According to information received in Japan, the Italian Government, faced with a deteriorating foreign exchange situation, is planning on restricting foreign imports. Should controls be extended to imports of fishery products, they are expected to greatly affect Japanese tuna trade with Italy. However, Japanese trading firms are of the opinion that the Italian Government may not impose trade restraints on the importation of frozen tuna but will likely impose restrictions on the importation of canned tuna. (Suisancho Nippo, February 3, 14, and 21, 1964.)

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NO INCREASE IN DUTY-FREE FROZEN TUNA IMPORT QUOTA:

In 1963, the Italian tuna industry requested the Italian Government to increase to 60,000 metric tons the quantity of frozen tuna that could be imported into Italy on a duty-free basis. However, due to the deteriorating foreign exchange situation in that country, informed Japanese observers believe that it is unlikely that the hoped-for increase will be granted. It is likely the quantity of frozen tuna that Italy will allow to be brought in on a duty-free basis will be held to 40,000 metric tons, as before. (Nihon Suisan Shimbun, February 24, 1964.)

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JAPANESE FROZEN TUNA REJECTS REPORTED:

Sizable quantities of Japanese-caught Atlantic Ocean big-eyed tuna exported to Italy were rejected by Italian packers in February 1964, reportedly due to a dark meat condition. The Italian packers not only rejected whole shipments of big-eyed but demanded a reduction in prices ranging from 20-40 percent. They are also considering sending a delegation to Japan this summer. Japanese trading firms believe that the Italian delegation will attempt to capitalize on the present big-eyed quality problem and seek to conclude a standard supply contract during its visit to Japan. (Suisancho Nippo, March 5, 1964.)

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JAPAN PROPOSES TO PARTICIPATE IN CANNED TUNA PROMOTION PROGRAM:

In response to the request made by the Italian tuna industry to assist in the promotion of canned tuna sales in Italy, the Italian Subcommittee of the Japan Frozen Foods Exporters Association, at a meeting on March 2, 1964, in Japan to study the Italian request, drafted a proposal to contribute 6 million yen (US$16,667) for the promotion of canned tuna in Italy. Of that sum, the Japanese Government would be asked to contribute half, and industry's contribution would be equally shared between exporters and producers.

The draft proposal was scheduled to be taken up for study at the executive session of the Exporters Association. (Suisan Tsushin, March 4, 1964.)

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PROJECT TO TAG YOUNG TUNA INITIATED IN SICILY:

A project for tagging young bluefin and albacore tuna (Thunnus thynnus L. and Germo alalunga) in a zone between the Baltic Gulf and the Aeolian Islands was recently undertaken by the Experimental Center for the Fishing Industry and Marine Products at Messina (Sicily), Italy. The project was initiated by the Italian Directorate for Fisheries based on recommendations made by the General Fisheries Council for the Mediterranean and the Biology Branch of the Food and Agriculture Organization (FAO).

A total of 25 bluefin tuna 32 to 36 centimeters (12.6 to 14.2 inches) long, and 10 albacore tuna 28 to 32 centimeters (11.0 to 12.6 inches) long were tagged at the time the project was started.

The tag is described as a "spaghetti-type" tag made of yellow plastic, is about 8 inches long, and is attached on to the back of the fish. Fishermen who catch the tagged fish are requested to return the tag to the Experimental Center in Messina with information on the exact location where the fish was caught, size, weight, and any other pertinent details.

Japan

FROZEN TUNA EXPORT QUOTA FOR UNITED STATES:

The Japan Frozen Foods Exporters Association, at a meeting on February 27, 1964, tentatively agreed to set the fiscal year 1964 (April 1964-March 1965) export quota of frozen tuna to be shipped from Japan proper to the United States at 66,500 short tons, consisting of 24,000 tons of albacore, 36,000 tons of yellowfin, and 6,500 tons of tuna loins. (Suisancho Nippo, February 28, 1964.)

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FROZEN TUNA EXPORT QUOTAS FOR FY 1964:

The Japan Export Frozen Tuna Producers Association, at a special general meeting on March 10, 1964, approved frozen tuna export quotas for fiscal year 1964 (April 1964-March 1965):

1. Exports to the United States from Japan proper--24,000 short tons of albacore, 36,000 short tons of yellowfin, plus an adjustment quota of 15,000 short tons.

2. Indian Ocean transshipments to the United States--4,000 short tons.

3. Atlantic Ocean transshipments to the United States--120 vessel trips (equal to about 35,000 short tons).

4. Exports of Italy--43,000 metric tons.

5. Tuna loins for export to the United States--6,500 short tons.

Also at the March 10 meeting the Association approved the establishment of the Overseas Base Committee (composed of representatives from the three largest fishing companies) and, at the same time, allotted a frozen tuna export quota of 6,000 short tons for overseas bases. (Nihon Suisan Shimbun, March 13, 1964.)

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ATLANTIC FROZEN TUNA EXPORT PRICES:

Prices in mid-March 1964 of Japanese-caught Atlantic Ocean tuna exported to the United States and Italy, according to Suisan Tsushin, March 24, 1964, were:

To United States (f.o.b. Las Palmas):
Albacore (frozen round) - US$330-335 a short ton.

To Italy (c.i.f. Italy):
Yellowfin (dressed with tail) - $405-410 a metric ton.
Bluefin (dressed with tail) - $380-385 a metric ton.

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EXPORT PRICES FOR FROZEN ATLANTIC TUNA:

The price (f.o.b. Las Palmas, Canary Islands), of Japanese-caught Atlantic Ocean forzen tuna exported to the United States is reported as follows as of February 1964: round albacore US$335 a short ton; gilled-and-gutted yellowfin $310-335 a short ton. (Suisan Tsushin, February 22, 1964.)

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THIRD SALE OF CANNED TUNA TO UNITED STATES:

The Japan Canned Foods Exporters Association met on February 25, 1964, to discuss the third sale of canned tuna in brine to the United States. It agreed to export a total of 160,000 cases, consisting of 120,000 cases of white meat tuna and 40,000 cases of light meat tuna, for the third sale. Including the first two sales, this makes a total of 460,000 cases to be released for export to the United States. However, of that amount, only 160,000-170,000 cases are estimated to have been shipped as of the beginning of March. (Suisancho Nippo, February 28; Suisan Tsushin, March 3, 1964.)

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VALUE OF FROZEN AND CANNED TUNA EXPORTS, DECEMBER 1963 AND YEAR 1963:

Japan's exports of frozen tuna to the United States in December 1963 were valued at US$1.4 million and exports of canned tuna at $0.7 million. The United States took 27.9 percent of Japan's total frozen tuna exports in that month and 47.8 percent of the total canned tuna exports.

Value of Japan's Exports of Selected Fishery Products, 1962-1963

Product	Year 1963			Year 1962		
	To U.S.	Total	U.S. Share	To U.S.	Total	U.S. Share
	(In US$1,000)		%	(In US$1,000)		%
Tuna, frozen . .	17,575	46,158	38.1	32,269	55,399	58.2
Tuna, canned . .	14,263	22,721	62.8	12,869	19,591	65.7

Note: Exports are value f.o.b. Japan.
Source: Customs Bureau, Japanese Ministry of Finance.

Japan (Contd.):

Exports of frozen tuna from Japan to the United States in 1963 were down 45.5 percent in value as compared with the previous year. For the same year, the export value of canned tuna increased 10.8 percent.

The United States took 38.1 percent of Japan's total frozen tuna exports in 1963 as compared with 58.2 percent in 1962. The United States' share of Japan's total canned tuna exports in 1963 was 62.8 percent as against the previous year's 65.7 percent. (United States Embassy, Tokyo, February 14, 1964.)

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EXPORTS OF CANNED TUNA IN OIL, APRIL-DECEMBER 1962-1963:

Data compiled by the Japan Tuna Packers Association indicate that canned tuna in oil approved for export by that Association for the period April-December 1963 totaled over

Japanese Exports of Canned Tuna in Oil by Country of Destination, April-December 1962-1963

Country of Destination	April-December 1963	April-December 1962
	(Actual Cases)	
West Germany	530,702	384,500
Canada	175,958	161,354
United Kingdom	144,818	62,137
Switzerland	101,779	88,925
Netherlands	78,816	71,232
Belgium	73,311	67,878
Lebanon	80,877	38,817
Aden	63,266	20,803
Others	259,554	125,649
Total	1,509,081	1,021,295

1.5 million actual cases, a 50-percent increase over the same period in 1962. (Suisan Tsushin, February 1, 1964.)

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FISCAL YEAR 1964 EXPORT TARGET FOR FISHERY PRODUCTS:

The Japanese Ministry of International Trade and Industry, at a meeting on March 13, 1964, set the fiscal year 1964 (April 1964-March 1965) export target for marine products at US$159.5 million, an increase of 14.3 percent over the 1963 target of $139.5 million. (Suisan Keizai Shimbun, March 15, 1964.)

Japanese Marine Products Export Target for FY 1964

Commodity	FY 1964	FY 1963
	(US$1,000)	
Frozen:		
Tuna	61,627	57,184
Swordfish	4,320	5,700
Shrimp	2,174	3,200
Salmon	1,940	2,000
Rainbow trout	1,415	1,080
Others	13,530	11,250
Subtotal	85,006	80,414
Other Products:		
Cultivated pearls	51,300	41,200
Fresh tuna & tunalike fish	16,095	10,000
Agar-agar	1,260	1,900
Salted & dried marine products	5,800	6,000
Subtotal	74,455	59,100
Grand total	159,461	139,514

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ALLOCATION PLANNED OF OVERSEAS BASES TUNA EXPORT QUOTA:

The Japan Frozen Foods Exporters Association has under consideration a plan whereby member firms would contribute to the Association 10 percent of their overseas base export quota. The contributed 10 percent would then be pooled and be distributed to those exporting firms which do not have an overseas base export quota or reallocated to those firms which have consumed their base export quotas and wish to export additional quantities of tuna.

Overseas bases that will be affected by this plan, if adopted, are American Samoa (export quota 27,000 short tons), Santo, New Hebrides (6,000 short tons), Penang, Malaysia (6,000 short tons), and Noumea, New Caledonia (7,500 short tons). (Suisancho Nippo, February 13, 1964, and other sources.)

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TUNA INDUSTRY ORGANIZATIONS SEEK TO IMPROVE THEIR MANAGEMENT:

The Steering Committee of the Japan Frozen Tuna Sales Company met on March 5, 1964, to discuss ways in which the operational costs of the Sales Company could be reduced, as requested by the tuna producers providing financial support to that organization. The Committee, unable to arrive at any definite conclusion at that meeting, has scheduled a second meeting.

It was suggested at the March 5 meeting that the most logical way to improve management was to consolidate the business affairs of the Sales Company, which handles the sale of frozen tuna consigned to it by the Export Frozen Tuna Producers Association. The annual operating expense of the Producers Association is 18 million yen (US$50,000) and that of the Sales Company 20 million yen ($55,555)--total 38 million yen ($105,555). Some producers want the total combined expenditures for those two organizations kept below the 30-million-yen ($83,333) level.

On March 10, the Export Frozen Tuna Producers Association convened a special general

Japan (Contd.):

meeting to discuss business plans for fiscal year 1964 (April 1964-March 1965). It was decided at that meeting to establish a liaison committee to coordinate the plans and activities of the five committees (Atlantic Ocean, Indian Ocean, Transshipment, Direct Shipment, and Loin Committees), with each committee to have equal representation on the Liaison Committee.

At that meeting also, the Chairman announced his support for the recommendation to reduce the operational costs of the Frozen Tuna Sales Company and pointed to the need for conducting a comprehensive review for the purpose of developing a rational management policy for the frozen tuna industry. (Suisan Tsushin, March 6 & 11, 1964.)

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TUNA MOTHERSHIP RETURNS FROM EASTERN PACIFIC:

The Japanese portable-boat-carrying tuna mothership Keiyo Maru (3,700 gross tons) returned to Tokyo on February 13, 1964, after being out at sea for 8 months. The mothership carried eight 20-ton portable boats, and operated in the eastern Pacific Ocean (mainly in the area between longitudes 81° W. and 133° W. and south of the equator to 23° S. latitude).

The Keiyo Maru landed a total of 1,880 metric tons of fish: 260 tons of yellowfin (14 percent); 211 tons of albacore (11 percent); 622 tons of big-eyed (33 percent); 330 tons of spearfish (18 percent); and 457 tons of sharks and other miscellaneous fish (24 percent). The eight portable boats, fishing with long lines, averaged 1,652 metric tons of fish per set. (Hokkai Shimbun, February 3; Suisancho Nippo, February 17, 1964.)

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HALIBUT VESSELS LICENSED FOR TRIANGLE AREA OF EASTERN BERING SEA:

The Japanese Fisheries Agency has licensed 1 mothership and 7 long-line vessels to operate in the halibut fishery in Area 3B North Triangle of the Eastern Bering Sea, which was scheduled to open March 25, 1964. Seven additional Japanese vessels were expected to be licensed to fish for halibut in that area if the over-all area quota of 6,393,340 pounds was not attained by United States, Canadian, and Japanese vessels by late April 1964. (United States Embassy, Tokyo, March 10, 1964.)

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TRAWLERS LICENSED TO FISH EASTERN NORTH PACIFIC:

On February 28, 1964, the Japanese Fisheries Agency announced that it would license a total of six trawlers to fish on an experimental basis in the eastern North Pacific in 1964. One trawler would be licensed to operate on a year-round basis, while the other five trawlers would be licensed to operate for a seven-months period, beginning April 1. Six fishery firms are involved with one trawler each.

The fishing vessels are: Akebono Maru No. 51 (1,470 gross tons), Tenryu Maru (545 gross tons), Taiyo Maru No. 81 (2,800 gross tons), Taiyo Maru No. 76 (2,150 gross tons), Daishin Maru No. 15 (1,500 gross tons), and Kohoku Maru (290 gross tons).

Japanese stern-trawler Akebono Maru No. 51.

The stern trawler Akebono Maru is the one licensed to operate on a year-round basis. Three of the firms are being licensed to operate trawlers in the Gulf of Alaska waters for the first time this year. On the other hand, the Fisheries Agency rejected the application submitted by another firm to operate a trawler in the Gulf in 1964, rather than a long-liner as in 1963. That firm operated the bottomfish long-liner Seiju Maru last year, and was reported to have suffered considerable financial loss.

In addition to licensing three more trawlers than in 1963, the Agency extended the area of operation to the west by five degrees and to the east by 10 degrees. The 1964 area of operation includes the waters north of 50° N. latitude (same as in 1963) between west longitudes 175° (in 1963 170°) and 135° (in 1963

Japan (Contd.):

145°). The Agency is also permitting ship-to-ship transfer of catches at sea to increase operating efficiency. (Suisan Keizai Shimbun, February 29, 1964.)

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EASTERN BERING SEA BOTTOMFISH FISHING FLEETS FOR 1964 SEASON ANNOUNCED:

According to the Japanese Fisheries Agency, 14 motherships and 228 catcher vessels are authorized to operate in the bottomfish fishery in the Eastern Bering Sea during the 1964 season. This is a reduction in fleet size of 5 motherships and 17 catcher vessels operated in the 1963 season.

As of February 19, 1964, only one mothership, the Chichibu-Maru and its 12 catcher vessels had been licensed for operation in the Bering Sea area. The Chichibu-Maru, owned and operated by one of Japan's larger fishing companies, is authorized to conduct its fishing operations in waters south-west of a line drawn from Cape Navarin (Siberia) to Cape Sarichef (Unimak Island, Alaska) for the period February 1, 1964, to January 31, 1965. Of the 12 catcher vessels accompanying the Chichibu-Maru 10 will operate otter trawls and 2 will use Danish seines. Fishing operations will be primarily centered on catching shrimp but ocean perch and herring are included as a part of the production goal of the fleet.

The Chichibu-Maru is equipped with a one-line shrimp cannery capable of canning 2,000 cases (48 7-oz. cans per case) daily and a freezing plant capacity of handling 150 metric tons of fish and shellfish a day. The catch target or production goal is reported to be 350,000 cases of canned shrimp, 10,300 tons of frozen shrimp, 1,900 tons of frozen ocean perch, and 200 tons of frozen herring. Two trips are planned to the fishing grounds, one for the period February 1 to July 15, and the second from August 15 to December 31.

Table 1 - Japanese Bering Sea Bottomfish Fishery Mothership Fleet, 1964 1/

Name of Mothership	Gross Tonnage	Catcher Vessels 2/ Otter Trawl	Paired Trawl	Danish Seine	Long line & Gillnet	Total Catcher Vessels
Gyokuei-Maru	10,357	-	11	19	-	30
Ibuki-Maru	2,502	-	-	1	-	1
Shikishima-Maru	10,144	-	2	22	-	24
#2 Chichibu-Maru	1,693	2	6	-	-	8
Einin-Maru	7,482	1	14	-	-	15
No. 82 Taiyo-Maru	2,840	1	-	-	-	1
Soyo-Maru	11,192	2	12	14	-	28
Tenyo-Maru	11,581	1	5	22	-	28
Hoyo-Maru (formerly Renshin-Maru)	14,094	-	14	16	-	30
Seifu-Maru	8,269	-	-	13	15	28
Itsukushima-Maru	5,871	-	-	9	9	18
Tone-Maru	535	-	-	-	2	2
No. 15 Kotoshiro-Maru	701	-	-	-	3	3
Total motherships	(13)					
Total catcher vessels		7	64	116	29	216

1/The mothership Chichibu-Maru and 12 catcher vessels shown in table 2.
2/Number of catcher vessels subject to change.

Table 2 - Composition of Chichibu-Maru Fleet to Operate in 1964 Bering Sea Bottomfish Fishery

Name of Vessel	Gross Tonnage	Type of Vessel	Area of Operation
Chichibu Maru	7,421	Mothership	S.W. Cape Navarin and Cape Sarichef
No. 50 Nisshin-Maru	263	Otter Trawler	"
No. 51 Nisshin-Maru	263	" "	"
No. 52 " "	263	" "	"
No. 53 " "	266	" "	"
No. 55 " "	265	" "	"
No. 56 " "	265	" "	"
Yohko-Maru	341	" "	"
Shoko-Maru	315	" "	"
No. 3 Akebono-Maru	343	" "	"
No. 10 Akitsu-Maru	337	Long-liner-Gill-netter	"
No. 17 Myojin-Maru	100	Danish Seiner	"
Gyoan-Maru	84	Danish Seiner	"

Fig. 1 - A Japanese mothership Einen Maru.

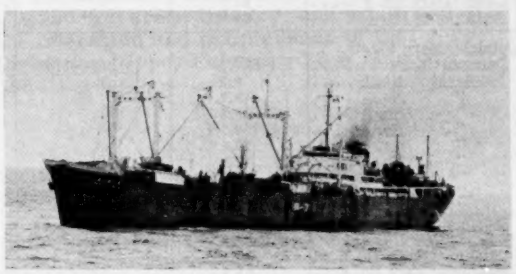

Fig. 2 - Japanese mothership Hoyo Maru (formerly the Renshin Maru.

Six Japanese motherships (accompanied by 138 catcher vessels) of the 14 authorized to operate in the Eastern Bering Sea bottomfish fishery were scheduled to depart in April 1964 for the fishing grounds. They were the Tenyo Maru (11,581 gross tons) departing April 8; Gyokuei Maru (10,537 gross tons), April 10; Einin Maru (7,482 gross tons), April 15; Hoyo Maru (formerly the Renshin Maru 14,094 gross tons), April 23; Tone Maru (535 gross tons), mid-April; and the Seifu Maru (8,269 gross tons), late April. (Fisheries Attache, United States Embassy, Tokyo, February 28, 1964, and Suisancho Nippo, March 23, 1964.)

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TWO MOTHERSHIPS ISSUED LICENSES FOR 1964 KING CRAB OPERATIONS IN EASTERN BERING SEA:

The Japanese Fisheries Agency issued licenses to nine Japanese fishing companies to process (can) king crab in the Eastern Bering Sea during the 1964 season. Four of the firms will carry out joint canning operations on the factory-ship Tokei-Maru (5,385 gross tons) and the remaining 5 companies will process their catch on the Dainichi-Maru (5,859 gross tons). The combined production quota for the two fleets was set at the 1963 level of 235,000 cases (48 - #1/2 cans per case) of which 120,000 cases were allocated to

Japan (Contd.):

the Tokei-Maru fleet and 115,000 cases to the Dainichi-Maru fleet.

The two factoryships sailed from Hakodate on March 1. The Tokei-Maru has an attached fleet of 8 Kawasaki vessels (portable launch-type vessels or skiffs) and 6 catcher boats and the Dainichi-Maru is accompanied by a fleet of 9 Kawasaki vessels and 6 catcher boats.

Japan's King Crab Mothership Fleet Licensed to Operate in Eastern Bering Sea in 1964

Name of Vessel	Gross Tons	Type of Vessel
Tokei-Maru Fleet:		
Tokei-Maru	5,385.6	Mothership
Kawasaii No. 1	8.6	Skiff
" No. 2	8.4	"
" No. 3	8.7	"
" No. 5	8.4	"
" No. 7	8.9	"
" No. 8	8.6	"
" No. 10	8.9	"
" No. 11	8.9	"
Kogyo-Maru No. 7	84.3	Catcher Boat
(Unknown)	84.6	"
Taihei-Maru No. 8	75.0	"
Kaiun-Maru No. 18	73.9	"
Choei-Maru No. 3	81.7	"
Meiji-Maru No. 1	84.9	"
Dainichi-Maru Fleet:		
Dainichi-Maru	5,859.1	Mothership
Kawasaki No. 1	9.8	Skiff
" No. 2	9.7	"
" No. 3	9.8	"
" No. 5	9.7	"
" No. 7	10.1	"
" No. 8	10.1	"
" No. 10	10.2	"
" No. 11	9.0	"
" No. 12	8.2	"
Kanemoto-Maru No. 10	84.7	Catcher Boat
Oshima-Maru No. 11	84.9	"
Daikame-Maru No. 2	82.1	"
Matsuma-Maru No. 8	83.1	"
Mutsumi-Maru No. 28	72.5	"
Shunsho-Maru No. 25	84.8	"

The 1964 season operations were licensed for the period March 1 to December 31, 1964. However, it is anticipated that the quota will be attained before the expiration date of the licenses. (Fisheries Attache, United States Embassy, Tokyo, March 10, 1964.)

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STERN-TRAWLING OPERATIONS:

The President of a large Japanese fishing company, at a news interview held on February 17, 1964, at Shimonoseki, announced that his firm is constructing two 3,500-ton stern trawlers, which are expected to be completed in June 1964. They are scheduled to fish in the Eastern Bering Sea. At the same time, one of the two 1,500-ton stern trawlers presently assigned to the Bering Sea will be transferred to the trawling grounds off Africa. Thus, under this plan the firm will have 3 large stern trawlers operating in the Eastern Bering Sea and 3 more in the Atlantic Ocean. At the present time, the 1,500-ton stern trawlers Akebono Maru Nos. 51 and 52 are assigned to the Bering Sea and Nos. 50 and 53 to the Atlantic Ocean. (Nihon Suisan Shimbun, February 21, 1964, and other sources.)

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LONG-LINE FLEETS PLAN TO FISH BOTTOMFISH SOUTH OF WESTERN ALEUTIAN ISLANDS IN FALL 1964:

The Japanese Fisheries Agency reportedly plans to license 2 or 3 long-line fleets to fish on an experimental basis for bottomfish in the waters south of the western Aleutian Islands in fall of 1964. It is expected that the two companies involved will submit applications to operate bottomfish long-line fleets in those waters. Those same two firms had operated vessels north of the western Aleutian Islands in 1963 and are the only companies having operated vessels near the waters which the Agency plans to open up to experimental fishing.

One firm is expected to use the mothership Shikishima Maru (5,871 gross tons) and the other firm the mothership Seifu Maru (8,269 gross tons) for the fall bottomfish long-line operation.

The fleets would be licensed to operate for a four-month period, beginning in September 1964 (after the end of the salmon fishing season). The Agency expected to announce its findings by May. (Suisancho Nippo, February 20, and 24, 1964.)

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BOTTOMFISH FISHING OFF NEW ZEALAND:

Japanese fishing companies and fishing vessel operators are showing increasing interest in the bottom long-line sea bream fishery off North Island, New Zealand. Even tuna vessels operating in the waters nearby New Zealand are engaging in that fishery. One such vessel is the 420-ton Umigata Maru No. 8, which temporarily switched to fishing for sea bream in late 1963 due to poor tuna fishing. That vessel was fishing for bottomfish with four unpowered boats, and catching an average of about 5 tons of fish a day.

One small Japanese firm planned on sending the 1,184-ton freezer carrier Seiju Maru No. 3, deck-loaded with 10 small boats, to the New Zealand waters. Several other vessels are also outfitting for that fishery.

Japan (Contd.):

As of late February, the Fisheries Agency had received about 30 applications from groups interested in engaging in the New Zealand bottom long-line fishery. However, many of the applications are believed to have been submitted merely for the purpose of establishing "rights," should the Agency decide to place that fishery under a licensing system.

Following the influx of Japanese fishing vessels to the waters off New Zealand, the New Zealand Government has contacted the Japanese Government concerning violations of New Zealand's territorial waters committed by Japanese vessels. The Japanese Government has issued stern warnings to its fishermen concerning this infraction. The Japanese Government is also considering placing the New Zealand bottomfish fishery under a licensing system, beginning in 1965. (Suisan Tsushin, February 18 & 24; Minato Shimbun, February 4, 1964.)

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JAPANESE SHIPYARD LAUNCHES FIRST OF FIVE TUNA FACTORY-MOTHERSHIPS ORDERED BY U.S.S.R.:

On January 29, 1964, a Japanese shipyard held a launching ceremony at its Mukojima dockyard for a 5,000-gross-ton tuna factory-mothership, which is the first of 5 such vessels ordered in May 1963 by the Soviet Ship Import Association. Priced at about 1.3 billion yen (US$3.6 million), the newly launched vessel is scheduled for completion at the end of June 1964. Another tuna mothership was scheduled to be launched in mid-April. It is further scheduled that the remaining 3 tuna motherships for the U.S.S.R. will be launched during 1964 at the end of June, in mid-September, and in mid-December. Delivery of all the 5 vessels will be made by the end of March 1965.

The new mothership, named Leninskiv Luchi, will carry six 22-ton catcher vessels and will be capable of remaining at sea for periods ranging up to 7 months. It will be equipped with tuna processing and canning equipment, quick-freezing equipment, and oil manufacturing equipment.

Specifications of the new factory-mothership are as follows: length, 115 meters (377 feet); width, 17.4 meters (57 feet); depth 8.8 meters (28.9 feet); draft, 5.5 meters (21.3 feet); main Diesel engine, 3,450 hp.; and speed, 14 knots. (Nihon Kogyo Shimbun, February 2, 1964.)

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TRAWLERS TO BE EXPORTED TO GHANA:

A Japanese fishing company concluded final arrangements for delivery to the Ghanaian Government Fisheries Corporation of twelve 1,800-ton stern trawlers, the export of which was approved by the Japanese Government in 1963. The trawlers are to be delivered to Ghana according to the following schedule: 1964, two trawlers; 1965, three trawlers; 1966, three trawlers; and 1967, four trawlers.

Another Japanese fishing company is said to be proceeding with plans to export a large trawler to Ghana, and has already completed preliminary negotiations with a Ghanaian private citizen of considerable wealth. Reportedly, the Japanese firm plans to export to Ghana a 1,500-ton stern trawler, and would assist in the operation and maintenance of that vessel. (Suisanho Nippo, February 28 & March 2, 1964.)

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SKIPJACK TUNA PURSE-SEINING TEST OFF PHILIPPINES PROPOSED:

A large Japanese fishing company submitted a petition to the Fisheries Agency requesting that it be permitted to conduct experimental purse-seine fishing for skipjack tuna south of the Philippine Islands and for yellowtail in the waters north of New Zealand for about three months, beginning mid-March. The company planned to employ the converted purse-seine vessel Kenyo Maru (260 gross tons).

The Kenyo Maru is equipped with a power-block and is the first Japanese fishing vessel to use that gear. For the past two years, that vessel conducted test fishing for skipjack off northeast Japan. (Shin Suisan Shimbun, March 9, 1964.)

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NORTH PACIFIC SALMON FISHERY USES MONOFILAMENT GILL NETS:

Monofilament gill nets (originally used in the Japanese North Pacific on an experimental basis a few years ago) are now widely used in the salmon fishery. It is estimated that in 1964 about 60 percent of the gill nets to be

Japan (Contd.):

used in the Japanese mothership-type salmon fishery will be made up of monofilament nets. (Suisan Tsushin, March 6, 1964.)

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POLYPROPELENE TANGLE NETS TO BE USED IN KING CRAB FISHERY:

After several years of experimentation, one large Japanese fishing company is planning this year on completely changing the king crab tangle nets employed by its mothership (Kaiyo Maru, 5,549 gross tons) operating in the Okhotsk Sea to nets made from polypropelene. Reportedly, the polypropelene net is not only as strong and efficient as the synthetic fiber net presently in use, but is cheaper and easier to handle. The Japanese firm is also reported to be planning on field testing this year about 100 shackles of specially made polyvinyl king crab tangle nets which can be discarded after being used once. (Suisan Tsushin, March 12, 1964.)

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ANTARCTIC WHALING:

The Nisshin Maru No. 3 (23,406 gross tons) whale fleet (belonging to Japan's largest fishing company) is on its way home from the Antarctic whale fishing grounds. As of March 8, 1964, that fleet is reported to have not only met its target of 111 blue-whale units (118 finback whales and 312 sei whales) but has exceeded its original catch target of sperm whales by 561, harvesting a total of 2,665 sperm whales.

The six other Japanese whaling fleets are reported to be doing well also, and were expected to meet their quotas in a few weeks. (Suisan Tsushin, March 11; Suisancho Nippo, March 12, 1964.)

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STERN TRAWLER BUILT IN JAPAN FOR RUMANIA:

The 3,603-ton stern trawler built in Japan for Rumania departed Shimonoseki, Japan, on on March 3 for New Zealand waters on an experimental fishing trip. On board that trawler are 17 Japanese fishing and gear experts who will train the Rumanian crew on fishing techniques. The vessel is later expected to operate in the northwest Atlantic Ocean. (Nihon Suisan Shimbun, March 9, 1964.)

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MARKET FOR SHRIMP:

Some Japanese shrimp dealers in mid-March 1964 were reported to be dumping imported frozen shrimp on the Japanese market even at a loss. Reportedly, 21-25 count Mexican frozen shrimp in 5-lb. cartons were being sold for 1,800 yen (US$5) a carton.

The dumping was attributed to several factors: (1) large supply of shrimp on hand in Japan; (2) need for immediate cash, since March 30 was accounts-settlement date in Japan. Primary blame is placed on the excessive competition taking place after the importation of shrimp was liberalized under the Japanese Government's trade liberalization program. (Minato Shimbun, March 17, 1964.)

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WHALING OPERATION IN ECUADOR:

The establishment of a whaling operation in Ecuador presents many difficult economic problems due to the lack of adequate facilities, including the lack of water and electrical power supply, reports the chief of the whaling department of Japan's largest fishing company, who returned to Japan from Ecuador in mid-March. Another problem cited was the great distance of the whaling grounds from the contemplated base. He stated that he did not engage in any concrete talks with Ecuadorean officials concerning the establishment of Japanese whaling operations in Ecuador. (Suisancho Nippo, March 14, 1964.)

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ANTARCTIC WHALING FLEETS:

Four of Japan's seven whaling fleets operating in the Antarctic Ocean were reported to have met their whale quotas as of mid-March. The remaining three fleets were expected to meet their targets by the end of March. Japan's share for this season's Antarctic quota is 4,600 blue-whale units. (Minato Shimbun, March 17, 1964.)

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WHALING OPERATION IN BRAZIL:

Japan's largest fishing company has decided to terminate its whaling operations based in Brazil. The two whale catcher vessels assigned to the Brazilian base will be tied up at that base. The whaling operations reportedly are being halted due to the depressed Brazilian market for whale meat. (Suisan Tsushin, March 18, 1964.)

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Japan (Contd.):

EFFICIENCY STUDY OF TUNA VESSELS:
The Japan National Federation of Tuna Fishermen's Cooperative Associations is having a scientific organization analyze 1963 tuna vessel catch trends according to vessel sizes. Preliminary examination of the data shows that the operation of 180-ton tuna vessels, which in the past have been considered to be the most efficient among all the different classes of tuna vessels, again showed a profitable rate of return. On the other hand, 99-ton tuna vessels operating out of Japan proper fared poorly. (Suisancho Nippo, March 11, 1964.)

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SHIP-TO-SHIP FUELING OF TUNA VESSELS AT SEA:
The Japan National Federation of Tuna Fishermen's Cooperative Associations (NIKKATSUREN), at a conference in Tokyo on March 3, 1964, revealed that it is installing on the oil tanker which it plans to utilize for refueling tuna vessels at sea a 150-ton capacity fresh-water tank and two sea-water conversion units capable of producing five tons of fresh water per day. In addition, the tanker would carry provisions, particularly dried vegetables, which would be supplied to those fishing vessels receiving fuel and water.

In 1963 NIKKATSUREN, on an experimental basis, had chartered the 1,500-ton oil tanker Shimmei Maru for refueling tuna vessels on the high seas. The experiment was described as successful but it was strongly criticized by the fishermen's union and the Ministry of Transportation on grounds that the extension of time spent at sea worked hardship on crew members. It was recommended that the tanker should not only carry fuel but also fresh water and food, particularly fresh vegetables.

The proposal was also made that the tanker should have on board a doctor to treat fishermen at sea. This proposal is still under consideration.

The oil tanker to be chartered by the NIKKATSUREN was scheduled to depart Japan in mid-April. (Suisan Keizai Shimbun, March 5, 1964.)

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FIRM FILES APPLICATION TO IMPORT FROZEN YELLOWTAIL FROM MEXICO:
A Japanese trading firm has submitted an application to the Japanese Fisheries Agency to import 1,000 tons of frozen yellowtail (valued at US$200,000) from Mexico. Yellowtail is normally imported by Japan from the Republic of South Korea, but the Mexican yellowtail can be imported into Japan at a much cheaper price (about 30 percent cheaper based on c.i.f. value). (Suisancho Nippo, February 6, 1964.)

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NEW STERN TRAWLER TO FISH OFF SOUTH AFRICA:
A newly-built stern trawler, Taiyo Maru No. 76 (2,150 gross tons), of one of Japan's largest fishing companies, departed Shimonoseki, Japan, on February 17, for the trawling grounds off South Africa. (Suisan Tsushin, February 18, 1964.)

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FISHING COMPANY PLANS TO CLOSE SOUTH GEORGIA ISLAND WHALING BASE:
The Japanese fishing company which established a whaling base in South Georgia Island (British) in the South Atlantic Ocean in 1963, plans to close down operations at that base. The firm is reported to have not fared well in its operation. As of March 2, the firm's whaling vessels had harvested 189 fin whales and 379 sei whales (equal to 157.66 blue-whale units), and 32 sperm whales. The catch represents 60 percent of the target. Another Japanese fishing company which also had operated whaling vessels out of South Georgia closed its operations in December 1963 because it had also not fared well. (Suisancho Nippo, March 5, 1964.)

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LICENSING MORE VESSELS TO OPERATE IN NORTHWEST ATLANTIC PLANNED:
The Japanese Fisheries Agency is planning on issuing commercial fishing licenses for the operation of not more than ten large fishing vessels (ranging in the 2,000-3,000 ton-class) in the northwest Atlantic Ocean in the fall of 1964. At the present time, the Agency is permitting only experimental fishing in those waters. Vessels presently authorized by the Agency to operate on an experimental basis are the 3,500-ton stern trawler Tenyo Maru (fishing with two 300-ton trawlers) and the

Japan (Contd.):

1,100-ton trawler Aoi Maru No. 2. (Suisan Keizai Shimbun, February 21, 1964.)

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FREEZER CARRIERS TO TRANSPORT ATLANTIC TRAWL FISH TO JAPAN:

Two 1,800-ton freezer carriers owned by Japan's largest fishing company were scheduled to be launched on March 14, 1964, in southern Japan, at Nagasaki and at Shimonoseki. They are the Banshu Maru Nos. 10 and 11. They are being assigned to the Atlantic Ocean run to transport trawl-caught fish to Japan. (Nihon Suisan Shimbun, March 9, 1964.)

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FISHING VESSEL CONSTRUCTION LOAN PROGRAM PROPOSED:

The Japan Fisheries Society scheduled a general meeting at Tokyo on March 17, 1964, to discuss measures to meet foreign fisheries competition. Principal topic on the agenda is the vessel construction financial assistance program.

According to critics, the Government-operated Japan Development Bank is not giving positive assistance in the matter of providing loans for the construction of fishing vessels. Also, interest rates of 9-10 percent are charged by lending institutions on loans for the construction of domestic fishing vessels, while loans at 4 percent interest, with payment extended over seven years, are available for the construction of fishing vessels placed on order by foreign firms with Japanese shipyards.

The Society hopes to have a special fund set aside in the Development Bank specifically for the purpose of providing money at a low interest rate for the construction of fishing vessels so as to enable Japan to meet foreign competition effectively. (Suisan Keizai Shimbun, March 14, 1964.)

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FISHING VESSEL CONSTRUCTION PERMITS ISSUED:

March 13, 1964: The Japanese Fisheries Agency on March 13, 1964, issued permits for the construction of 30 fishing vessels: 13 wooden vessels totaling 500 tons gross and 17 steel vessels totaling 5,489 tons gross. Included were permits for 4 steel tuna vessels (192, 253, 354, and 362 tons), 3 steel distant-water trawlers (299, 314, and 2,950 tons), and one 39-ton wooden salmon long-liner. (Suisan Keizai Shimbun, March 17, 1964.)

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February 29, 1964: The Japanese Fisheries Agency on February 29, 1964, issued permits for the construction of 29 fishing vessels: 14 wood vessels (totaling 587 gross tons) and 15 steel vessels (totaling 4,987 gross tons). They include 1 wooden salmon vessel of 47 tons for the coastal drift-net fishery and 7 tuna vessels--1 wooden vessel (83 tons), and 6 steel vessels (4 of 192 tons and 2 of 253 tons). Also approved for construction was a 3,000-ton freezer carrier, to be called Ojika Maru, for transporting distant-water trawl-caught fish. (Suisan Keizai Shimbun, March 3, 1964.)

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January 31, 1964: Permits for the construction of 38 fishing vessels were issued on January 31, 1964, by the Japanese Fisheries Agency: 9 wood vessels (289 gross tons total) and 29 steel vessels (totaling 4,440 gross tons). Included are four tuna vessels ranging in size between 64- to 111-gross tons each; one 253-ton tuna long-liner; one 392-ton tuna long-liner; eight 96-ton steel salmon vessels for the salmon mothership fishery; one 69-ton steel gill-net vessel for the coastal salmon fishery; and a 1,510- ton carrier vessel.

On February 18, the Agency issued permits for the construction of 55 fishing vessels; 22 wood vessels (totaling 874 gross tons) and 33 steel vessels (totaling 4,335 gross tons). Included are four 96-ton steel vessels for the salmon mothership fishery; four 39- to 64-ton wooden gill-net and long-line vessels for the coastal salmon fishery; one 498-ton portable-boat-carrying tuna mothership plus one 19-ton portable boat; six 96- to 111-ton steel tuna vessels; and six 253- to 279-ton steel tuna long-line vessels. (Suisan Keizai Shimbun, February 4 & 21, 1964.)

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Japan (Contd.):

FISHERIES CONFERENCE:

A Japanese Korean fisheries conference convened at Tokyo on March 10, 1964. The following items were scheduled for discussion: (1) width of the territorial sea and establishment of base lines; (2) extent of sea areas to be placed under joint jurisdiction and methods of enforcement; (3) jurisdictional rights; (4) composition of the joint regulatory committee and authority to be delegated to that committee; and (5) form of fisheries assistance and amount of financial assistance. (Suisan Tsushin, March 11, 1964.)

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SUCTION PUMP FISHING:

A suction pump has been used to catch fish in Japan, it was reported at the fall meeting of the Japan Fisheries Academy in Otaru. In the course of a survey of modern fishery methods, a team of the Nihon University's Fishery Department was able to land a catch weighing 12.5 kg. (27.5 pounds) in 15 minutes with the aid of a pump. The experiments were conducted from an 11-ton vessel in waters near Ajishima Island off the Ojika peninsula in May and June 1963.

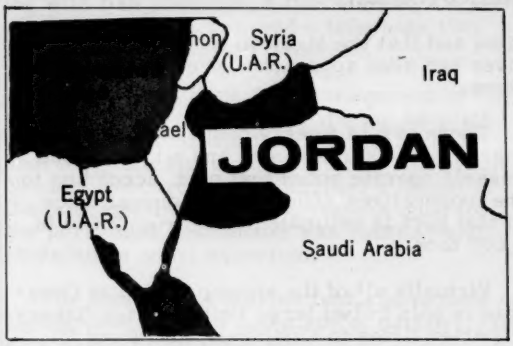
The suction pump was powered by an electric motor connected to a rubber hose 5 meters (16.4 feet) long, with a trumpet-shaped mouthpiece at one end. Lights installed on the ship and fixed to the mouthpiece attracted fish. The technique had been tried before, but on earlier occasions the fish were invariably damaged. It is believed, however, that Soviet fishing boats successfully employ the suction pump-fishing method in the Caspian Sea. (New Scientist, November 21, 1963.)

Jordan

FISHERY LANDINGS DROP IN 1963:

Jordan's fishery landings dropped from 185.8 metric tons in 1962 to 159.3 tons in 1963. Fishing agreements were signed which gave Jordan fishing rights in the territorial waters of Saudi Arabia and Sudan, but those rights have not yet been exploited and Jordanian fishermen still use rather primitive fishing methods.

The Jordan Development Board has plans for the purchase of a modern fishing vessel



with 20 to 30 tons of freezing capacity. If funds can be made available for that purpose, it is anticipated that the annual catch will rise to 600 or 700 tons. (United States Embassy, Amman, March 9, 1964.)

Mexico

JAPANESE PROPOSE JOINT VENTURE WITH GUAYMAS SHRIMP-FISHING COOPERATIVES:

According to an official of Mexico's Federacion de Corporaciones Pesqueras Sur de Sonora, which represents fishing cooperatives in Guaymas, a Japanese group visited him in February 1964 and proposed that the cooperatives enter into an agreement with the Japanese firm represented by the group to supply labor for fishing vessels which would be brought from Japan.

The Japanese vessels would be equipped with freezing equipment operated by Japanese technicians, and would pack shrimp, possibly for the European market. Wages would be a percentage of the catch, presumably at least equal to the percentage the cooperatives receive under their contract with Mexican vessel owners (armadores). The Japanese group assured the Mexican official that they were in a position to furnish his cooperatives with a more reliable market than the United States. The group was told by the cooperatives' representative that they would have to take the matter up with appropriate officials in Mexico City. The Japanese group was headed for Puerto Penasco after their Guaymas visit.

It was reported that the Japanese have been interested in a venture of this type for some

Mexico (Contd.):

time and that the Mexican fishing cooperatives had been approached previously by them.

There are 14 fishery cooperatives in Guaymas with 3,500 members, and a total of 238 vessels operate out of that port, according to the cooperatives' official. The annual catch at that port is estimated to be from 7,000 to 8,000 tons.

Virtually all of the shrimp landed at Guaymas is sold to two large United States fishery importer firms in California, and about 90 percent of the Guaymas income is from the shrimp industry. (United States Embassy, Mexico City, February 27, 1964.)

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NEW FISHING PORT PLANNED AT PROGRESO, YUCATAN:

The Department of Marine of the Mexican Government is investing 10 million pesos (US$800,000) in a new fishing port at Progreso, Yucatan, according to an interview published in El Universal, February 11, 1964.)

Since the present port at Progreso is considered inadequate for expanding fishing operations, the Government will construct a separate port in the marsh area to the west of the city. Principal construction will involve opening a bar in the harbor, dredging to to a depth of 10 feet, and building docks. The natural features of the marsh lend themselves to a relatively inexpensive, safe, sheltered harbor.

Construction is expected to be completed in early 1965. Auxiliary facilities will be built later. The new port is expected to facilitate the exploitation of fishery resources in the Gulf of Campeche and the Caribbean Sea. (Regional Fisheries Attache, United States Embassy, Mexico City, February 14, 1964.)

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FIRST MARINE EXHIBIT A SUCCESS:

As part of the Mexican Government's program to improve the national diet by an increased consumption of fishery products, Mexico's National Fisheries Consultative Commission staged a "Salon of the Sea and Its Resources" in conjunction with the Seventh Home Fair held in Mexico, City, February 14-March 15, 1964.

The marine exhibit covered an area of about 7,200 square yards, attracted very large crowds, and was considered an unqualified success. An estimated 100,000 persons attended the exhibit on the first Sunday and 80,000 the following Sunday. Weekday attendance included numerous school groups. Careful planning and plenty of hard work resulted in an attractive and educational exhibit that will give the traditionally land-oriented Mexican a better understanding and appreciation of his country's marine resources.

Description of Salon: The visitor was first greeted by a huge symbolic mural that set the theme for the entire exhibit, "The Conquest of our Marine Resources." As the visitor progressed through the exhibit, he was given an education in the ocean itself, its inorganic resources and particularly its living resources, the techniques of harvesting and utilization, and finally the end products in the form of canned and dried fishery products, vitamins, etc.

The first section of the exhibit was a well illustrated scientific presentation of the sea in all its aspects, with an explanation which stressed that it was oriented toward the exploitable resources, so as to bring home to the visitor how important the ocean is to him. Exhibits demonstrating the physical composition of sea water, marine geology, fossils, physical oceanography, and the extent of the world's oceans were followed by an exhibit on inorganic resources featuring salt production. Charts outlining the hydrologic cycle, the food chain, and the reproductive cycle introduced the section on marine life which followed a logical progression up the classical system of the plant and animal kingdoms. Step by step, illustrated by charts, photographs, preserved specimens, shells, shark jaws, skeletons, and models, the viewer was led from phytoplankton and kelp to marine mammals, with every intervening stage well represented by species important in the Mexican fisheries. Next was a demonstration of fishing methods, from the primitive to the modern, with descriptive material on fish culture and oyster culture. Charts showed the value of fishery products in nutrition, and a dining room scene had a table set with seafood.

An open court with an aquarium was surrounded by booths of cooperating government

Mexico (Contd.):

agencies. The aquarium consisted of a series of separate tanks displaying a variety of fresh-water fish and salt-water fish species. The aquarium was flanked by a display of ship models and an art gallery which contained paintings, sculpture, ceramics, jewelry, and metal work with a fishery motif or using abalone shell as part of the design.

The visitor then entered a section entitled "Man and the Fishery." In addition to photographs and models, that area contained a philatelic exhibit of stamps dealing with the fisheries and the sea, and a marine library. The industrialization section had models of a fish cannery, a fish-meal plant, and a working ice machine.

In another open court were models of boats and full-size small fishing boats, an actual patrol helicopter, and a full-size steel shrimp boat, along with marine engines, propellors, etc.

A motion picture room showed fishery and marine life films provided by the Governments of the United States, Norway, Japan, the United Kingdom, and Denmark.

The final governmental exhibit was a room containing a relief map of Mexico (including the coasts and fishing banks) which was set into the floor. The walls contained numerous colored charts showing Mexican fishery production and also large woodcuts of fishery scenes. Scientific and popular publications on the fisheries were exhibited.

The remainder of the Salon was a commercial exhibit of marine products, nets, machinery, boats, etc.

Cooperating Mexican Agencies: The National Fisheries Consultative Commission had primary responsibility for the Salon. Its technical consultant, was responsible for the entire exhibit, designing the layout, designing the relief map and fishery charts and even contributing some of the art is in the gallery.

The following government agencies had exhibits and otherwise furnished exhibits:

The Department of Fisheries of the Ministry of Industry and Commerce had an exhibit which included models of the marine biological station at El Sauzal, the plant at Tres Marias where inmates are rehabilitated by working with fish products, a fish market, a school of practical fisheries, and a telephone that answered questions on fisheries.

The National Bank for Development of Cooperatives had an exhibit featuring its pilot fishing port at Alvarado. This exhibit was shared by the Mexican Institute of Renewable Natural Resources. It contained a model of the port and models of the vessels built for the port. One boat model was cutaway and contained a novel aquarium.

The Ministry of Marine featured models of lighthouses, models and maps of harbors, full size navigational aids, etc.

The National Institute of Indigenes demonstrated Indian fishing activities.

The National Institute of Tourist Investigations illustrated the importance of the ocean in attracting both domestic and foreign tourists. The National Council of Tourism illustrated tourist attractions, highlighted by models and maps of the development at Punta Banda near Ensenada.

The Government company (CONASUPO) responsible for distributing staple food to low income groups demonstrated its fish program, principally dried fish. Recipe booklets were available.

The National Development bank had an exhibit showing how its loans have aided the fishing and allied industries. The Department of Game provided specimens of marine birds.

A chart at the entrance of the Salon acknowledged the assistance of several private Mexican firms, and the Embassies of Germany, Denmark, Japan, Norway, United Kingdom, and the United States, as well as the Food and Agriculture Organization (FAO), and United Nations.

Special Features: The two outstanding individual hits of the Salon were the aquarium and the shrimp vessel. Mexico is said to probably be the largest city in the world without some sort of aquarium and the live fish on display, therefore created a sensation. Reportedly live salt-water fish have never been exhibited in Mexico and this "first" created a stir. The logistics involved in transporting, and holding tropical marine fish at that high altitude location were said to have been formidable.

Mexico (Contd.):

The 75-foot steel shrimp vessel on display was cutaway lengthwise leaving some 60 percent intact to show the engine in place, the ice hold, crew quarters, navigational equipment, etc. It was built in Mazatlan by a shipyard known for its construction and export of shrimp vessels overseas. On the temporary ways it appeared huge to the inland people who were unacquainted with fishing vessels and stood around in crowds looking at it in awe.

Among the many features of the Salon were:

1. The more than 40 ship and boat models and the numerous factory, school and port models.

2. The hundreds of fish, mollusks, and crustaceans that were cleverly displayed in oval plastic bubbles suspended from the ceiling. These were preserved in 10 percent formaldehyde and were especially lifelike.

3. The numerous photographs, blown up to very large size--colored and black and white, underwater and above--provided a striking background.

4. Colored charts on the ocean added to the displays.

5. The Mexican Club of Exploration and Aquatic Sports (CEDAM) provided a fine exhibit of submarine archeology with many relics recovered from the bottom of the sea and from lakes.

6. An actual helicopter (made in U.S.) used for patrol by Mexico's Department of Fisheries.

7. Full size fishing vessels, an ancient dugout, a canoa or longboat (fiberglass), sailboats and runabouts (all fiberglass and all made in Mexico except for one from Japan).

8. The colored fishery charts (which were to be reproduced for publication), the relief map of Mexico, approximately 15 x 25 feet, and a large fisheries chart of the Gulf of Mexico.

Commercial Exhibits: The commercial section of the Salon contained exhibits by fishery products canners and producers of vitamins and other industrial fishery products, as well as fishing gear and marine supplies. Mexican-made products predominated, but imports were featured among the engines and electronic equipment.

Foreign made equipment on display was varied and included marine engines, generators, centrifuges, electronic navigation equipment, refrigeration machinery, and other marine engine parts from some half dozen countries.

The first "Salon of the Sea and Its Resources" was reported so successful that plans are being made to set up a permanent marine exhibit in Chapultepec Park in Mexico City. (Fishery Attache, United States Embassy, Mexico, March 10, 1964.)

Note: See Commercial Fisheries Review, April 1964 p. 63.

Morocco

TUNA AND SARDINE INDUSTRY DEVELOPMENT PROJECTS:

Tuna: A United States tuna fishery expert revisited Morocco at the invitation of the Moroccan Development Bank to work out a fishing contract with a United States tuna-fishing vessel of about 250 tons. The contract calls for the vessel to carry out a one-year exploratory fishing project to determine the amount, quality, and location of tuna that would be a available to an expanded tuna industry in Morocco. The cost of the exploratory project will be about $200,000. It will be financed by the Moroccan Development Bank and the Government of Morocco.

Sardines: A preliminary survey of the possibility of expanding the United States market for Moroccan sardines has been financed by the Moroccan Export Control Office at a cost of about $17,000. The survey concentrated on the results which could be obtained by (1) an improved marketing organization and (2) a new high-quality brand of Moroccan sardines on the United States market. (United States Embassy, Rabat, March 2, 1964.)

Netherlands West Indies

JAPANESE TUNA BASE AT ST. MARTIN:

A Japanese cold-storage company, which obtained approval from the Netherlands Government in 1963 to establish a tuna-fishing base on Saint Martin Island, Netherlands West Indies (situated east of Puerto Rico), has constructed a 1,100-ton cold-storage plant on that Island. The plant was scheduled for completion in March 1964.

To manage the fishing and cold-storage operations at that base, the Japanese firm in April 1963 established a wholly-owned subsidiary, capitalized at 102 million yen (US$283,333). In June 1963, the Japanese firm established another subsidiary company to handle the transshipment of fish from its Saint Martin base. The shipping company reportedly will operate the carrier vessel Zenko Maru No. 1. (Suisancho Nippo, February 10, 1964.)

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TUNA TRANSSHIPMENT QUOTA FOR ST. MARTIN BASE:

The Japanese firm which has been authorized by the Japanese Government to establish a joint tuna enterprise on St. Martin Island (located east of Puerto Rico), Netherlands West Indies, is expected to be granted a 2,000-short-ton transshipment quota for that base. Rather than allot a completely new quota for the St. Martin base, where the Japanese firm has constructed a 1,100 ton capacity cold-storage plant, the Government is planning to reduce that company's American Samoan quota of 8,000 short tons by 2,000 tons and reallocate that amount to the St. Martin base. (Nihon Suisan Shimbun, March 6, 1964.)

New Zealand

EXPORTS OF SMALL SPINY LOBSTER BANNED:

The exporation of small spiny lobster tails under six inches long has been banned by the New Zealand Government. The Government intends that instead of going overseas, those tails should be left on the spiny lobster and that whole spiny lobster should be marketed in 2-lb. consumer packs on the New Zealand market. Exporters, however, consider that New Zealanders will be reluctant to pay about 5s. (70 U.S. cents) each for small spiny lobsters. This is the price normally received overseas. They claim also that the ban will mean loss of overseas earnings, for New Zealand. (Australian Fisheries Newsletter, February 1964.)

Norway

EXPORTS OF CANNED FISH, 1963:

Norway's total exports of canned fish in 1963 were 4.8 percent less than in 1962. The decline affected all of Norway's principal canned fish products, except smoked small sild sardines. There was a particularly sharp decline in shipments to the United States due in large part to the recovery of the Maine sardine industry which recaptured a good part of the American market for canned sardines. (Norwegian Canners Export Journal, February 1964.)

Norwegian Exports of Canned Fish, 1962-1963

Product	1/1963	1962
	....(Metric Tons)....	
Brisling	5,368	6,288
Small sild	14,927	14,304
Kippered herring	3,149	4,242
Soft herring roe	719	797
Sild delicatessen	572	651
Other canned fish	3,309	2,950
Shellfish	1,547	1,851
Total	29,591	31,083

1/Preliminary.

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BIG HERRING RUN OFF NORTH COAST:

In early March 1964, a large mass of herring invaded the banks off north Norway from Harstad to Sandnessjøen. The biggest influx was at the mouth of Vestfjorden, off the Lofoten Islands, which traditionally is known for its cod fishery.

By the end of the first week in March 1964, the herring catch in the Vestfjorden totaled over 20,000 metric tons, with an ex-vessel value of more than Kr. 3 million (US$419,000). According to a fishery scientist, fishermen could land as much as 100,000 tons of herring before the run ended. However, the fishery was not expected to last very long. By the latter part of March, the herring probably spawned and moved into the deep ocean.

Norway (Contd.):

The large herring rush caused extensive damage to nets and in many cases more than half the catch was lost. (News of Norway, March 12, 1964.)

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FISHERIES TRENDS:

March 1964: HERRING: A total of 254,000 metric tons of winter herring had been landed along the Norwegian coast as the week end of March 21, 1964, at which time large herring catches were still being made in waters off the Lofoten Islands.

WHALING: Norway's 4 Antarctic whaling expeditions had processed 196,893 barrels of oil as of March 7, 1964, compared with 180,980 barrels by the same date in 1963, and 247,000 barrels by the comparable date in 1962. (News of Norway, March 26, 1964.)

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January 1964: Bad weather in January 1964 hampered Norwegian fishermen. On the north and west coasts, fishermen were able to fish only about one day a week on the average. Filleting and freezing plants were idle. On the south coast, large herring catches were taken in the Skagerrak during early January. Nine reduction plants in Haugesund and Karmoy reopened to process the catch, but storms soon interfered with fishing and the fish meal factories shut down again.

LOFOTEN COD FISHERY: A majority of the Fisheries Committee of the Norwegian Parliament has recommended that the ban on purse-seines in the Lofoten cod fishery be lifted for the coming season. The minority supported the opinion of the Ministry of Fisheries and the Fisheries Director that the ban should not be lifted.

WHALING: As of January 25, 1964, Norway's four Antarctic whaling expeditions had processed 86,475 barrels of whale oil and 29,480 barrels of sperm oil for a total of 115,955 barrels. This was 11,930 more barrels of oil than in the corresponding period of the 1962/63 season. (News of Norway, February 13, 1964.)

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MODIFIED 12-MILE FISHERIES LIMIT REJECTED:

In a statement to the 16-nation European Fisheries Conference in London, February 28, 1964, Norway affirmed that it could not subscribe to the new "6-plus-6" fisheries convention which was signed by 13 other countries. Norway objected to the provisions in the treaty which would recognize foreign fishing rights in the 6-12 mile coastal zone. (The Norwegian Parliament had previously authorized local fisheries limits extending a full 12 miles.) As a compromise, Norway offered to extend its present transitional arrangement for foreign fishing rights in the outer 6-mile zone from 1970 to 1974, but the proposal was rejected.

Commenting on the European Fisheries Conference, Arbeiderbladet, a Norwegian Labor Party newspaper, said, "Norway presented strong motivations for its standpoint. It was pointed out that fisheries play a decisive role all along our long and weatherbeaten coast. Therefore, it is of great economic and social importance to us to maintain our present fishery zone. It would be a heavy burden for our fishing population if all other countries permanently were to fish in all waters up to our 6-mile limit. . . . The London conference will now discuss future policies to guide trade in fish products. Here, vital interests are at stake for us. It will be a crucial political and diplomatic task to prevent a commercial isolation which, in the long run, can prove costly for Norway. If we were more or less excluded from European markets, the effect would be felt not least by those parts of Norway in greatest need of expansion and a stronger economy." (News of Norway, March 5, 1964.)

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BAN MAY BE RELAXED ON FOREIGN LANDINGS:

A new law relaxing the ban on landings of fish in Norway by foreign vessels has been proposed by the Norwegian Minister of Fisheries.

The rules now in force prohibit the landing of fish in Norway by foreign vessels when the catch has been taken by a conventional bottom trawl. Exceptions to that rule are only granted in an emergency, such as an accident at sea which forces a vessel to make for the nearest port.

Under the proposed new law, Norwegian processing plants would be permitted to re-

Norway (Contd.):

ceive fish from foreign vessels during periods of short supply. This has been advocated by some Norwegian operators for several years since their factories are sometimes closed down by seasonal shortages. It is thought that a law permitting foreign landings would result in a more stable supply of fish. (Fishing News, February 14, 1964.)

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FISH REACTION TO GEAR AND ENGINE NOISE STUDIED:

The Oceanographic Research Institute in Bergen, Norway, a branch of the Norwegian Fisheries Directorate, in early 1964 made a series of experiments in the North Sea, near some 350 purse seiners, to record noise made by engines and fishing gear. Researchers obtained sound recordings by lowering hydrophones into the sea at various distances from fishing vessels and fishing gear. The tape-recorded sound will be played back in aquaria where the reaction of various fish species can be observed. As the first step in this phase of the experiment, fish will be accustomed to a certain noise level while they are being fed. The same fish will than be exposed to different noise levels, such as those produced by engines and gear. Thus, investigators hope to measure and record deviations in the fish behavior pattern. The result might provide a better understanding of the extent to which it is necessary to reduce such noise. Efforts will also be made to clarify the reaction of various fish species to marine pressure waves, since fishing gear may create such waves. (News of Norway, March 5, 1964.)

Pakistan

SHRIMP-PRODUCING COSTS:

A leading shrimp exporting firm in Pakistan has estimated its average ex-vessel shrimp costs for the 6-months period ending February 1964 at Rs.1.50 (US$0.313) a pound for all shrimp purchased. For the larger shrimp normally exported to the United States. the ex-vessel cost per pound was Rs.2.00-3.00 ($0.417-0.626). Deheading the shrimp reduces the weight by about 40 percent, thus increasing the per-pound-cost of shrimp at the freezing stage to Rs. 3.33-5.00 ($0.695-1.043). (United States Embassy, Karachi, February 25, 1964.)

Peru

EXPORTS OF PRINCIPAL MARINE PRODUCTS, JANUARY-SEPTEMBER 1963:

Item	Quantity	Value[1]	
	Metric Tons	Million Soles	US$ 1,000
Fish meal	841,475	2,274.6	84,808
Fish oil	116,925	195.4	7,286
Fish (frozen, canned, etc.)	27,349	162.3	6,051
Sperm oil	7,079	27.1	1,010
Fertilizer (guano)	3,051	7.4	276
Whale meal	2,967	6.0	224

1/F.o.b. values converted at rate of 26.82 soles equal US$1.
Source: United States Embassy, Lima, March 4, 1964.

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FISH-CANNING INDUSTRY RESPONDS TO TAX CONCESSIONS:

Tax measures, enacted in September 1963 to revitalize the fish canning and allied industries in Peru, are apparently having the desired effect. The package of tariff exemptions and tax incentives has reportedly resulted in license applications to reopen 14 fish-canning plants. (United States Embassy, Lima, February 20, 1964.)

Poland

SHIPYARDS BUILDING LARGE TRAWLERS AND FACTORY-TRAWLERS:

A Polish shipyard at Gdansk is building a series of thirteen 1,250-ton factory-trawlers. Nine of the vessels are being built for the Soviet Union and 4 are for a Polish fishery organization based at Gdynia. The factory-trawlers are designed to carry a full range of processing equipment, including a fish meal plant with a daily capacity of about 25 metric tons. Refrigeration equipment will be installed to maintain storage holds at -18° C. (-0.4° F.). The design specifications of the vessels are: length over-all, 278 feet; breadth, 45.2 feet; draft, 17.7 feet; depth to main deck, 23.2 feet; deadweight, 1,250 tons; main engine, 2,400 hp.; operating speed, 12.5 knots; and operating range, 70 days.

Poland (Contd.):

A Polish shipyard located in Gdynia expects to launch at least twelve 600-ton trawlers by the end of 1965. The new trawlers will be capable of carrying 330 tons of fresh fish, 30 tons of fish meal, and 8 or 9 tons of fish-liver oil. The design specifications of the trawlers being built at Gdynia are: length over-all, 229.7 feet; breadth, 36.2 feet; deadweight, 600 tons; main engine, 1,620 hp.; operating speed, 14 knots: and operating range, 50 days. Each trawler will have accommodations for 41 crewmen. (The Fishing News, February 14, 1964.)

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MARINE FISHERIES LANDINGS IN 1963:

Polish marine fisheries production in 1963 amounted to 207,500 metric tons, surpassing the production goal for the year by 6,000 tons. The production in 1963 represented an increase of 13,000 tons or 26 percent over 1962. (The Fishing News, January 31, 1964.)

Portugal

TRAWLING OPERATIONS OFF SOUTH AFRICA:

An initial cargo of 700 metric tons of fish caught by Portuguese trawlers operating off the southwest coast of Africa was delivered in Portugal in late February 1964 by the Gil Eanes, according to Portuguese newspaper reports.

Due to the depletion of fishing grounds worked by Portuguese fishermen off the northwest coast of Africa, as well as new fishing restrictions imposed by some countries, Portuguese trawlers have been compelled to move to more distant fishing grounds off the South Africa Republic. It is understood that Portuguese trawlers received authorization to land their catches at unspecified ports of the South Africa Republic where they were frozen and later picked up by the Gil Eanes. If the first shipment is profitable, plans have been made to construct one or more vessels for expanded shipments in the future. (United States Embassy, Lisbon, February 29, 1964.)

South Africa Republic

PILCHARD-MAASBANKER-MACKEREL FISHERY, 1963:

South Africa Republic west coast landings of maasbanker and mackerel during the short season in November and December 1963 amounted to 13,763 short tons. Added to the previous west coast catch of pilchards, maasbanker, and mackerel during the main fishing season from January to July, this brought the total South Africa Republic west coast shoal fish catch in 1963 to 483,167 tons, compared with 545,569 tons in the previous year.

The November 1963 catch of 9,171 tons of maasbanker yielded 1,497 tons of fish meal, 42,211 gallons of fish body oil, and 2,436,312 pounds of canned maasbanker.

The December 1963 catch consisted of 4,402 tons of maasbanker and 190 tons of mackerel for a total of 4,592 tons, which yielded 828 tons of fish meal, 29,255 gallons of fish body oil, 968,328 pounds of canned maasbanker, and 99,168 pounds of canned mackerel.

The total landings from the 1963 pilchard-maasbanker-mackerel fishery in the South Africa Republic during 1963 yielded 111,068 tons of fish meal, 6,764,911 gallons of fish body oil and 24,509,840 pounds of canned fish. (The South African Shipping News and Fishing Industry Review, February 1964.)

Note: Data shown above only include landings and production in the South Africa Republic. The data do not include landings and production in South-West Africa.

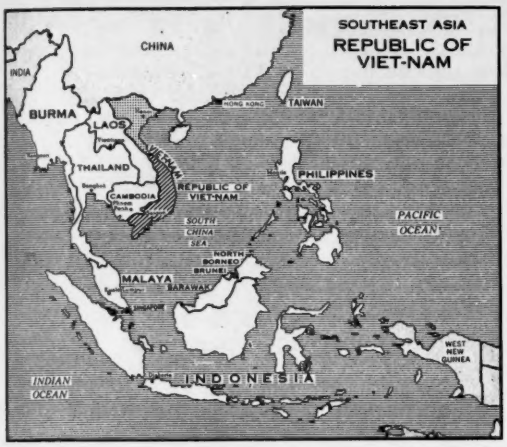
South Viet-Nam

SHRIMP FISHING POTENTIAL:

The Kien Giang Province in South Viet-Nam was visited in late February 1964, by an economic survey team composed of representatives from the United States Agency for International Development (AID), the Government of South Viet-Nam, and a represntative of a United States firm.

Preliminary information developed during the survey indicated that even though shrimp fishing is incidental to the Province's regular fishing activities, the port of Rach-Gia on the Gulf of Siam is still able to supply substantial quantities of shrimp to the local and Saigon

South Viet-Nam (Contd.):



markets. It is evident that the potential availability of shrimp is greater than indicated by past catches.

It is believed that with proper guidance, improved techniques, and concentration on shrimp fishing, a sizable frozen shrimp plant could be maintained in Kien Giang Province. (United States Embassy, Saigon, February 28, 1964.)

Spain

FISH MEAL PRODUCTION AND IMPORTS, 1962/63 AND FORECAST 1963/64:

During the production year November 1962-October 1963, the Spanish fish meal supply for animal feed amounted to 103,249 metric tons, with imports accounting for 70,358 tons of the supply and domestic production accounting for 32,891 tons. (An additional 1,147 tons of fish meal for fertilizer were produced in Spain.) In the same period of 1963/64, forecasts indicate that the Spanish fish meal supply for animal feed will amount to 140,000 tons. The forecasts predict an increase in imports to 110,000 tons, but a decline in domestic production to 30,000 tons. Production and imports represent Spanish consumption of fish meal, since Spain is not presently exporting fish meal.

Spanish mixed feed manufacturers are reported to have agreed to buy 30,000 tons of fish meal a year from domestic producers, after which the remainder of the supply needed can be imported. Fish meal produced in Spain has been more expensive than imported fish meal. In November 1962, the price of domestic fish meal (60 percent protein) on the Spanish wholesale market was 11,750-13,000 pesetas per metric ton (US$178-196 per short ton), while the price of imported fish meal (60-65 percent protein) was 11,000 pesetas per metric ton ($166 per short ton). The price of domestic fish meal showed little tendencey to decline on the Spanish market until December 1963 when the price of domestic meal (60 percent protein) fell to 9,200-9,500 pesetas per metric ton ($139-144 per short ton). The price of imported fish meal in Spain during December 1963 was not reported. (United States Embassy, Madrid, March 3, 1964.)

Note: 59.95 pesetas equal US$1.00.

Taiwan

FISHERIES TRENDS IN 1963 AND OUTLOOK FOR 1964:

The increase in Taiwan's 1963 deep-sea fishery landings was largely due to good catches made by tuna long-line vessels added to the fleet that year. The outlook for the 1964 deep-sea fishery landings is reported promising and expected to exceed those in 1963.

In December 1963, Taiwan's Provincial Government agreed to permit 36 Kaohsiung tuna vessels of 50 tons or less to use Penang as a supply and transshipment base for their fishing operations in the Indian Ocean. In early 1964, the Government agreed to let at least 10 Kaohsiung tuna vessels (all 80 gross tons except one of 120 tons) fish in waters off American Samoa. A representative of one of Taiwan's fishing firms left Taiwan about that time for a survey of that fishing area. It was reported that the entire catch is to be sold to a United States tuna-canning firm in American Samoa.

To the deep-sea fishing fleet will eventually be added the 16 tuna vessels to be built

Taiwan (Contd.):

from the US$7.8 million loan extended Taiwan by the International Bank for Reconstruction and Development (IBRD), which was signed in September 1963. Earlier this year, the Taiwan Fisheries Bureau was drawing up specifications for construction of those vessels, following which invitations to bid on their construction were to be issued by the Central Trust of Taiwan.

Toward the latter part of 1963, a 550-ton vessel with a crew of 31 sailed for Cameroon. In line with an agreement between Taiwan and Cameroon, the fishing crew aboard that vessel and other vessels will demonstrate their fishing operations to Cameroon fishermen. Another vessel left in early 1964 for the same destination and purpose.

The 12 long-line vessels (160 to 210 gross tons each) added to the fleet in 1963 under a loan from the Joint Commission for Rural Reconstruction (JCRR), operated in the Indian Ocean between February and August 1963. It was reported that 4 of the 12 vessels may be converted to trawlers for fishing in the South China Sea. Another five privately-owned tuna fishing vessels (130 to 200 gross tons) fished in the Indian Ocean during 1963 using Penang and Singapore as a supply base.

Taiwan's fishery exports in 1963 were valued at about $1.5 million which exceeded the value of the 1962 exports and indicates a growing emphasis on the deep-sea fisheries. The exports included about 225 metric tons of frozen shrimp valued at $500,000, most of which went to Japan. It was estimated that the exports included about 2,874 tons of tuna valued at $915,000. One fishing firm which operated six fishing vessels (4 of 350 gross tons and 2 of 600 tons) in the western Indian Ocean accounted for about 2,000 tons of Taiwan's total 1963 tuna exports. (United States Embassy, Taipei, February 19, 1964.)

Note: See Commercial Fisheries Review, March 1963 p. 69.

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FISHERIES AIDED BY WORLD BANK LOAN FOR PURCHASE OF MODERN FISHING VESSELS:

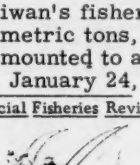
The International Bank for Reconstruction and Development has granted Taiwan a loan of US$7.8 million for the purchase of 16 modern tuna-fishing vessels. The initial agreement was signed in September 1963. The fishing industry of Taiwan comprises deep-sea and coastal fishing as well as fish farms.

At the end of 1961, Taiwan's fishing fleet consisted of 5,800 motorized vessels totaling 84,000 gross registered tons. The loan will be used for the construction and equipment of 13 vessels of 300 tons each and 3 of 1,000 tons. Each of the 1,000-ton vessels will have on board at least two 20-ton auxiliary vessels.

It is expected that the addition of the new vessels will increase the value of landed fish by $4½ million a year.

In 1961, Taiwan's fishery landings totaled about 300,000 metric tons, and in 1962 its tuna exports amounted to about $700,000. (The Fishing News, January 24, 1964.)

Note: See Commercial Fisheries Review, December 1963 p. 78.



Thailand

FISHERY SUBSIDY FUND USE:

Officials of the Fish Marketing Organization (FMO) reported on February 18 that the FMO Subsidy Fund established in 1952 to provide assistance to the fishing industry had accumulated a total of 4,623,159 baht (approximately US$230,000) of which 3,323,689 baht had been expended to aid the industry. Among the projects aided by the fund have been the construction of new piers to facilitate unloading of the fish catch from the fishing boats. The fund is financed through fees imposed on persons selling fish to the FMO, with the fees established as a percentage of the price obtained from the FMO for the fish. (United States Embassy, Banghok, February 26, 1964.)

Tunisia

FISHERIES DEVELOPMENT:

The Office National des Peches (ONP), an agency of the Government of Tunisia, has outlined current and planned fisheries development in Tunisia as follows:

The Tunisian annual fisheries catch increased from 12,803 metric tons in 1957 to 25,000 tons in 1962, and is expected to reach 40,000 tons in the 1970's. The objective of the ONP is to raise fishing activities from the

Tunisia (Contd.):

handicraft to the industrial level and to undertake offshore fishing after 1965.

Several fishing harbors in Tunisia are being built or improved at Tabarka, La Goulette, Kelibia, Mahdia, and Zarzis. The ONP has purchased thirty 20-meter trawlers since 1959 at a total cost of US$1,800,000. Those vessels represent one-third of the modern Tunisian fishing fleet. Ten more trawlers have been purchased from Yugoslavia for delivery in 1964. Sixty more 20-meter vessels will be purchased between 1965 and 1970. Tenders for the purchase of 2 vessels for offshore fishing will be issued in 1964.

Three shipyards already exist in Tunisia at Bizerte, La Goulette, and Sfax. One hundred small vessels for coastal fishing have been built in those shipyards. After 1965, when the ONP hopes to have 2 new shipyards completed, plans call for the launching of 50 small fishing vessels each month in order to replace obsolete sailing craft. (This could lead to a sizable market for small marine motors in Tunisia.)

In 1963, a total of 500 tons of fish meal was produced in Tunisia at plants in Sidi Daoud and La Goulette. A new fish-meal plant with a daily capacity of 25 tons is being built. A canning plant for sardines, anchovies, and mackerel operates at Sidi Daoud.

The distribution network for fish products in Tunisia includes 40 retail shops. Thirty new shops will open in 1964. A network of refrigeration plants is being built at the harbors and in the interior. It will be served by 50 refrigerated trucks.

Two cold-storage plants costing $240,000 are being built at Sfax and Gabes to freeze fishery products for export to Europe. To handle foreign distribution, the ONP maintains sales offices in Marseilles, Algiers, and Rome. The ONP plans to open foreign sales offices in Paris and Milan in 1964.

The ONP is also working to develop the shellfish resources of Tunisia. Forty tons of lobsters a year are taken during the summer season near Galite Island. Plans call for that catch to be increased to 60 tons. Cultivation of oysters in Tunisia is expected to eventually employ 1,000 people. (United States Embassy, Tunis, March 19, 1964.)

Note: See Commercial Fisheries Review, April 1960 p. 65.

U.S.S.R.

FISHING FLEETS IN ATLANTIC OCEAN AND BERING SEA:

According to a Soviet publication dated February 22, almost all of the 548 fishing vessels attached to the Soviet Union's Western Fisheries Headquarter (responsible for the management of vessels based in the Baltic Sea region) prior to that date were fishing in the Atlantic Ocean. Since the beginning of 1964, they had caught over 100,000 metric tons of fish, exceeding by 10,000 tons the catch for the same period in 1963. The Baltic Sea fishing fleet is said to have exceeded its production quota by 130,000 metric tons.

According to another report in a Russian periodical dated February 25, prior to that date there were over 250 Russian fishing vessels operating in the Bering Sea. The vessels were primarily after flatfish and rockfish. (Suisancho Nippo, March 2 and 5, 1964.)

* * * * *

THREE MORE FREEZER-TRAWLERS ORDERED FROM DANISH SHIPYARD:

The Soviet Union has ordered three additional fish freezer-trawlers of 2,550 gross tons each from a Copenhagen shipyard. The vessels will cost about Kr. 70 million (US$10.2 million) and delivery is to be made by the end of 1965. They will be similar to, but are to be improved versions of, the series of 4 vessels completed by the shipyard in 1962 and 1963, and the series of 4 vessels now being built at the same shipyard.

The vessels are equipped to trawl over the stern or to receive catches from accompanying fishing vessels. The fish are dressed and frozen on board.

More than 30 fishing vessels of this type and similar types have been built for the Soviet Union by the Copenhagen shipyard since World War II. Credit terms rather than price was the more important consideration in obtaining this newest order.

U. S. S. R. (Contd.):

According to a newspaper report, negotiations are under way for the construction of an additional 16 refrigerator vessels. (Regional Fisheries Attache for Europe, United States Embassy, Copenhagen, March 4, 1964.)

* * * * *

FOUR NEW FREEZER-TRAWLER DELIVERED TO SOVIET ATLANTIC FISHING FLEET:

The Soviet Western Fishery Administration, headquartered at Riga, has received four new freezer trawlers of medium size for its Atlantic fleet. The new vessels are of a type being constructed serially at the Kiev Shipyards. They can fish with trawls or drift nets. Each vessel is equipped with a main engine of 800 horsepower. When under way or during prolonged trawling, automated steering gear on the vessels can be controlled electronically. The freezing capacity of each trawler is 6 metric tons of fish a day. Three of the four vessels (Ampera, Saturnas, and Aloia) have joined the Lithuanian fishing fleet.

In addition to the four new freezer trawlers for the Atlantic fleet, a fifth vessel (Al'tair) of this type will be delivered to the Soviet Far Eastern fishing fleet. (Rybnoe Khoziaistvo, January 1964.)

* * * * *

EASTERN BERING SEA AND GULF OF ALASKA FISHING ACTIVITIES, MARCH 1964:

The Soviet fishing fleet in the northeastern Bering Sea in late March 1964 was believed to have consisted of at least 125 trawlers, 15 freezerships, 4 factoryships, and 3 cargo vessels. The major emphasis of the fleet was thought to have shifted from herring to Pacific ocean perch and, to a lesser degree, to flounder and sole.

In March 1964, a small Soviet fleet began fishing in the vicinity of Chirikof Island in the Gulf of Alaska. Limited observations indicated they were seeking primarily Pacific ocean perch. Estimates indicated that about 18 trawlers, 1 factoryship, and at least 2 freezerships as well as support vessels were involved in the operation. The size of the fleet was expected to increase rapidly.

In March 1964, another Soviet fleet was fishing in the Gulf of Alaska about 65 miles west of Yakutat. That fleet consisted of about 35 vessels, including 2 factoryships, a tanker, and about 30 trawlers, which were making excellent catches of Pacific ocean perch. That is the first large-scale Soviet exploitation of the Pacific ocean perch concentrations found off Yakutat by Russian exploratory vessels in 1960 and 1961.

Large-scale Soviet fishing operations in the Gulf of Alaska in 1964 began earlier than in past seasons. The fleet off Yakutat represented the most easterly concerted Soviet fishery on record. (Unpublished sources.)

* * * * *

SOVIET SCIENTISTS DEVELOP NEW SPECIES OF SALMON AND STURGEON:

Soviet scientists of the Pacific Fisheries and Oceanography Research Institute (TINRO) are reported to have produced a hybrid salmon from the small but prolific mesu salmon of the Indian Ocean and the larger but less fertile Pacific salmon. At first the crossing produced sterile fish. But after 18 months of experimenting, young were produced which were capable of reproducing themselves while maintaining the size and birthrate qualities of the original species. The average size of the new hybrid is from 4-5 kilograms (8.8-11.0 pounds), which is about 3 times as large as the Indian Ocean salmon. The new salmon is said to have an excellent taste.

The Moscow Institute of Marine Biology has announced that one of its scientists has succeeded in hybridizing 2 varieties of sturgeon after 10 years of experimental work. A small but fecund sterlet sturgeon was crossed with a great sturgeon. The latter species range up to 6 meters (20 feet) in size. In August 1963, over 30,000 fingerling of the new hybrid sturgeon were introduced into the Proletarian Reservoir, west of Rostov Na Donu. (Unpublished sources.)

United Kingdom

FREEZER-TRAWLER LANDS FROZEN BLOCKS OF WHOLE FISH:

The first complete freezer-trawler (the Ross Fighter) operating out of Grimsby landed 230 metric tons of 100-pound quick-frozen fish blocks composed of whole (round fish

United Kingdom (Contd.):

caught off the coast of Norway early in February 1964.

The vessel sailed from Grimsby on December 18, 1963, and had sufficiently good fishing during the first week of fishing operations so that it seemed the trip would be completed in about 30 days. The good fishing, however, was followed by a 10-day period of exceptionally cold weather and ice. Fishing was resumed when the weather moderated, and it continued until the vessel's refrigerated fish hold was nearly full to capacity. When the vessel docked, the blocks of frozen fish went directly into a cold-storage warehouse. The blocks will be withdrawn, thawed out, and processed as required.

The Ross Fighter was converted from a conventional steam-driven trawler into a Diesel-engine freezer-trawler and is owned by a British fishing firm which has recently built a number of new type small stern trawlers. (Fish Trades Gazette, February 15, 1964.)

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DANISH-BRITISH TALKS ON FISHERY COOPERATION:

Cooperation in fisheries was among the subjects discussed by the British Foreign Secretary in the course of his official visit to Denmark in early February 1964.

Agricultural and fishery products make up an important part of the trade between the two countries. Only West Germany rivals the United Kingdom as a market for Danish fishery products. In January-November 1963, Danish fishery exports to the United Kingdom were valued at over £4 million (US$11.2 million). This would indicate that it would be to Denmark's advantage to avoid any rift that might follow the exclusion of British fishing vessels from Danish waters, or those of her dependencies, the Faroe Islands and Greenland.

Following the announcement of majority agreement on a draft convention for modified 12-mile fishery limits at the second session of the European Fisheries Conference in London, it became clear that while Denmark was willing to allow traditional fishing rights to British vessels in Danish waters, similar rights could not be granted around the Faroes and Greenland.

On the other hand, there is growing concern among British fishermen, that while they are being denied access to grounds they have fished for decades, British markets remain open to all.

Denmark's fish-exporting trade could be affected by the recent announcement of accelerated tariff reduction between countries in the European Common Market (EEC), which includes West Germany. This might be detrimental to trade between EEC countries and nonmember countries, in which case the British market would become even more important to Danish fishery exporters.

It is unlikely that the British Foreign Secretary's visit led to any change in the 12-mile fisheries limit for the Faroese, but the British fishing industry feels there is a possibility of a change in negotiation on Greenland's limits. (The Fishing News, February 7, 1964.)

CORRECTION

The article, "Trawler 'Stella Leonis' Wins Silver Cod Trophy for 1963," which appeared in Commercial Fisheries Review, March 1964 page 75, incorrectly reported 1963 landings of fish by the Stella Leonis as 553,784 pounds. The vessel actually landed 39,556 kits (5,537,840 pounds) in 1963.

FEDERAL ACTIONS

Department of Commerce

AREA REDEVELOPMENT ADMINISTRATION

ALASKA BOTTOMFISH INDUSTRY POTENTIAL TO BE STUDIED UNDER TECHNICAL ASSISTANCE PROJECT:

Approval of a $12,000 technical assistance project to study the potential of the Alaskan bottomfish industry was announced by the Area Redevelopment Administration (ARA) of the U.S. Department of Commerce on March 23, 1964. The project will be completed in about five months.

Soviet and Japanese fishing fleets carry on heavy fishing operations off Alaska. The foreign fleets include factoryships equipped with cold-storage and processing equipment.

There is a large United States market for bottomfish (cod, flounder, ocean perch, etc.). At present the United States imports 300 million pounds of bottomfish annually. The ARA survey will help determine if American fishermen can gain a larger share of that market, and the conditions of production and processing required for success. (Area Redevelopment Administration, March 23, 1964.)

* * * * *

INDUSTRIAL LOAN TO ALASKAN COLD-STORAGE FIRM HANDLING FISHERY PRODUCTS:

The Area Redevelopment Administration (ARA) of the U. S. Department of Commerce on March 18, 1964, announced approval of a $184,100 industrial loan to the Valdez Cold-Storage Company, Inc., Valdez, Alaska. The ARA funds will help finance a project to expand dock facilities at Valdez, and to purchase, renovate, and equip a factoryship for freezing and processing. The project should aid the salmon and crab industries in the area and help create 91 direct and related new jobs.

The ARA industrial loan, which is repayable in 15 years at an annual interest rate of 4 percent, is conditioned on the provision of a $56,670 loan by a local bank to help finance the project. In addition, the Valdez Development Company will invest $28,330, and the company will provide $14,170 in equity. (Area Redevelopment Administration, March 18, 1964.)

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LAKE SUPERIOR COMMERCIAL FISHING INDUSTRY TO BE AIDED BY TECHNICAL ASSISTANCE PROJECT:

The approval of a technical assistance project to provide advisory and research services to help improve the commercial fisheries industry in the Lake Superior area was announced by the Area Redevelopment Administration (ARA) of the U. S. Department of Commerce on March 5, 1964. ARA will provide $83,500 in technical assistance funds and the U. S. Department of the Interior will contribute $19,000 to finance the project, which will be directed by the Interior Department's Bureau of Commercial Fisheries in cooperation with scientists of Michigan State University.

During the past 20 years, the 16-county region adjacent to Lake Superior has relied on the fishing industry as a basic source of income. Since 1954 there has been a severe decline in commercial fishing in the area due to the near extinction of the lake trout population because of sea lamprey depredation. Trout fishing in Lake Superior has been closed since June 1962 in an effort to maintain breeding stock.

As part of the new assistance project, two-man technical teams will consult with the processors and fishermen in an effort to expand income and employment through increased efficiency of operations and marketing. The project will also seek to expand consumer use of the abundant supplies of lake herring, smelt, chub, and other small fish which have been considered less marketable because of size. In order to spread

the fishing season over longer periods, the project will experiment with trawl fishing, a technique which has proved effective in Lake Michigan and Lake Erie. (Area Redevelopment Administration, March 5, 1964.)

Department of the Treasury

COAST GUARD

HEARINGS ON LIGHTS AND FOG SIGNALS ON OFFSHORE PLATFORMS IN THE GULF OF MEXICO:

The Merchant Marine Council of the U. S. Coast Guard held hearings March 23, 1964, on proposed changes in Coast Guard regulations. One of the proposed changes would reduce the number of lights on offshore platforms in the Gulf of Mexico and in general relax the regulations with respect to the lights and fog signals required on some of the offshore platforms.

Officials of the National Fisheries Institute opposed the proposed amendments to the regulations (Subchapter C--Aids to Navigation). An attorney representing shrimp fishing interests also opposed the proposed amendments. At the conclusion of the testimony, the Chairman of the Council announced that the Coast Guard had received a request that action on the proposed amendment regarding lights and fog signals on offshore platforms be deferred for a period of 90 days, and stated that the request had been granted.

Eighty-Eighth Congress

(Second Session)

Public bills and resolutions which may directly or indirectly affect the fisheries and allied industries are reported upon. Introduction, referral to committees, pertinent legislative actions by the House and Senate, as well as signature into law or other final disposition are covered.

ALASKA DISASTER RELIEF: S. 2719 (Jackson and others) introduced in Senate April 8, 1964, to amend the Alaska Statehood Act (act of July 7, 1958; 72 Stat. 339) and for other purposes; referred to Committee on Interior and Insular Affairs. Discussing the bill, Senator Jackson spoke from the floor of the Senate stating in part, "I sent to the desk for appropriate reference, a bill authorizing an Office of Alaska Reconstruction which will provide, through earthquake insurance, reasonable protection to the people of that State against loss of or damage to their real and personal property. In order to provide assistance to Alaskan property owners and businessmen for damage caused by the recent earthquake and related disasters, benefits under this proposed Federal insurance and reinsurance program would be retroactive to the date of Alaska statehood, January 3, 1959. The program's terms of insurance would be determined by the Office of Alaska Reconstruction. . . ." Senators Bartlett, Gruening, and Magnuson, who joined with others in sponsoring the bill, also spoke from the floor of the Senate on the Alaskan disaster and the State's need for assistance. (Congressional Record, pages 7010-7019.) A companion bill, H. R. 10818 (Rivers), was introduced in House April 13, 1964; referred to the Committee on Interior and Insular Affairs. The Senate Committee on Interior and Insular Affairs, sitting as a Special Committee of the Whole on Alaska, held hearings April 14 and 15, 1964, on S. 2719. Testimony was received from Congressmen Rivers, the Mayor of Kodiak, the Mayor of Anchorage, and public witnesses. The hearings were recessed subject to call. On April 15, 1964, the Speaker of the House presented a memorial of the Legislature of the State of Alaska, memorializing the President and the Congress of the United States relating to a national Natural Disaster Insurance Act.

On April 16, 1964, Subcomittee on Fisheries and Wildlife Conservation of the House Committee on Merchant Marine and Fisheries held a hearing regarding the effects of earthquakes and tidal waves on Alaskan fisheries. Testimony was received from Senator Gruening, Congressman Rivers, the Governor of Alaska, and officials of the U. S. Department of the Interior. The testimony included an outline of a proposed four-point Federal program to meet the immediate needs of the Alaskan fishing industry.

H. R. 10686 (Pelly) introduced in House April 6, 1964, to provide financial assistance to Alaskan fishermen adversely affected by the earthquake of March 27, 1964, and resulting tidal waves; referred to the Committee on Merchant Marine and Fisheries.

On April 7, 1964, the President signed into law (P.L. 88-296) H. J. Res. 976, making a supplemental appropriation of $50 million to replenish the disaster relief fund of the President. On March 18, 1964, the Federal Disaster Act Report (H. Doc. 249) from the President was printed in the Congressional Record, page 5348. Included was a report of the status of disaster relief funds as of December 31, 1963. These funds are to be used for aid in Alaska earthquake-damaged areas.

Senator Gruening, along with various other Senators, spoke from the floor of the Senate on March 30, 1964, concerning the recent earthquake and tidal waves in Alaska and along the West Coast. He announced that a program would be prepared concerning the disaster for presentation to the President and the Congress. (Congressional Record, pages 6272-6276.)

Senator Bartlett also spoke from the floor of the Senate on the above subject on March 30, 1964, stating that the Alaskan fishing industry had been very hard hit. (Congressional Record, pages 6349-6353.) On March

31, 1964, Senator Gruening spoke from the floor of the Senate, inserting in the Congressional Record, (pages 6396-6411) news articles describing the damage in Alaska from the recent earthquake and tidal waves. One of the articles (New York Times, March 31, 1964) concerned the possibility of a price increase in fishery products, particularly canned crab. On April 2, 1964, Senator Gruening spoke from the floor of the Senate inserting in the Congressional Record pages 6547-6559, additional news articles describing the damage in Alaska from the recent earthquake and tidal waves. One of the articles discussed the possible effect on salmon resources of the loss of water in the Copper River. Another article mentioned a proposal to make fishing vessels available to Alaska fishermen to harvest salmon during the coming fishing season. Senator Gruening also discussed the Alaskan disaster from the floor of the Senate April 13, 1964 (Congressional Record, pages 7571-7572), and April 17, 1964 (Congressional Record, pages 7986-7987).

ANTIDUMPING ACT AMENDMENT: H. R. 10832 (Herlong), and similar bills through H. R. 10868, introduced in House April 14, 1964, to amend the Antidumping Act, 1921; referred to the Committee on Ways and Means. The objective of the U. S. Antidumping Act is to prevent foreign manufacturers from injuring American industries by dumping surplus merchandise here at prices below those charged in the exporting country. If the Treasury Department finds a price differential, and the Tariff Commission finds an American industry is injured, the foreign manufacturer must pay the differential to the Treasury in dumping duties. Bills were introduced in the 1st Session of the 88th Congress to make the Act more effective in achieving its original purpose and to help insure that international trade would be conducted in a fair and equitable manner.

In introducting H. R. 10832, Congressman Herlong spoke from the floor of the House stating, in part, "I should like to make clear that the 1964 amendment to the Antidumping Act represents a merging of the proposals embodied in the amendments introduced during the first session of this (88th) Congress with a few proposals which add to, modify, or delete various provisions. . . ." The Congressman's remarks, appearing in the Congressional Record, pages 7601-7602, continued with a detailed description of the proposed changes contained in the 1964 amendment to the Antidumping Act.

COAST GUARD APPROPRIATIONS: On March 24, 1964, Congressman Garmatz addressed the House on the subject of the Coast Guard equipment replacement and improvement program. He discussed the effects of a $10 million reduction in the funds authorized under P.L. 88-281 for procurement of vessels and aircraft and construction of shore and offshore establishments for the Coast Guard. The Congressman inserted in the Congressional Record (page 5964) a list of projects to be deferred to make a reduction of $10 million in Coast Guard appropriations for fiscal year 1965. The list of projects that would be deferred included the construction of one medium endurance vessel for fisheries patrol off the New England coast.

CONSERVATION OF MARINE FISHERIES RESOURCES: The House Committee on Merchant Marine and Fisheries met in executive session on March 25, 1964, and ordered reported favorably to the House S. 1988 (amended), to prohibit fishing in the territorial waters of the United States and in certain other areas except by domestic vessels or as provided by international agreement.

Fishing In U.S. Territorial Waters (Hearings before the Committee on Merchant Marine and Fisheries, House of Representatives, 88th Congress, 2nd Session), 208 pp., printed. Contains hearings held Feb. 19, 20, 25, and 26, 1964, on S. 1988, and related bills. Includes the text of S. 1988, H. R. 7954, H. R. 8296, H. R. 9957, H. R. 10025, and H. R. 10040; reports from various Federal agencies; and statements of Congressmen, Federal and state officials, and industry personnel.

H. R. 10492 (Downing) introduced in House March 18, 1964, to extend the national sovereignty of the United States over certain waters; referred to the Committee on Foreign Affairs. Would extend "complete and exclusive national sovereignty over the waters within a line 12 geographical miles distant from the line of ordinary low water along that portion of the coast of the United States which is in direct contact with the open sea and the line marking the seaward limit of inland waters."

On March 21, 1964, Senator Bartlett spoke from the floor of the Senate on fisheries limits and inserted in the Congressional Record (page 5660) a paper entitled, "The Theory and Practice of the 12-Mile Fishery Limit," which had been presented to the Gulf and Caribbean Fisheries Institute at their meeting in Miami, Fla., during November 1963.

FEDERAL WATER RESOURCES RESEARCH PROGRAM: On March 23, 1964, the House received a communication from the President of the United States, transmitting a report by the Federal Council for Science and Technology entitled Federal Water Resources Research Program for Fiscal Year 1965; referred to the Committee on Interior and Insular Affairs.

FOOD MARKETING NATIONAL COMMISSION: A message was received in the Senate, April 1, 1964, from the President making legislative recommendations for establishment of a National Commission on Food Marketing to study the food industry from farm to consumer. In his message the President said, in part, "...Information is not now available to permit an informed judgment concerning the effect of the recent changes in the food industry. We do not know whether the benefits of advanced technology are being fairly distributed among farmers, processors, distributors, retailers, and consumers. We do not know whether shifts in bargaining power require new laws. We do not know enough about the new character of the industry to determine the extent of the benefits and the need for any relief from hardship which may be necessary." Referred to Committee on Commerce. The message was printed in the Congressional Record, page 6484, April 1, 1964. By unanimous consent, the Senate adopted an amendment on April 1, 1964, to substitute language of the proposed legislation recommended by the President for establishment of a National Commission on Food Marketing for the text of S. J. Res. 71, introduced April 26, 1963, directing the Federal Trade Commission to make an investigation of chainstore practices which may be in violation of antitrust laws. S. J. Res. 71 was pending in the Senate Committee on Commerce. Companion resolutions introduced were H. J. Res. 977 (Cooley), H. J. Res. 978 (Roosevelt), H. J. Res. 979 (Kastenmeier), H. J. Res. 980 (Rosenthal), and H. J. Res. 983, (Olson) introduced in House April 6, 1964, and H. J. Res. 996 (Cunningham) introduced in House April 14, 1964; all referred to the Committee on Agriculture. The resolutions introduced

April 6 were discussed on the floor of the House by Congressman Roosevelt (Congressional Record page 6683) and Congressman Kastenmeier (Congressional Record, page 6718, April 6, 1964.)

On April 13, 1964, the Senate Committee on Commerce continued hearings on S. J. Res. 71, to establish a National Commission on Food Marketing to study food marketing from the farm to the consumer. The Committee heard testimony from an Assistant Secretary of Labor on April 13, and from the Secretary of Agriculture on April 16, 1964.

FOREIGN FISHING VESSELS OFF U. S. COASTS: On April 16, 1964, Senator Jackson spoke from the floor of the Senate concerning foreign fishing vessels off U. S. coasts, and the proposed extension of Canadian fishing limits to 12 miles. (Congressional Record, page 7938.)

HALIBUT WEEK: H. Con. Res. 285 (Pelly) introduced in House April 6, 1964, and H. Con. Res. 287 (Stinson) introduced in House April 14, 1964, requesting the President to proclaim the 6-day period beginning May 18, 1964, and ending May 23, 1964, as National Halibut Week; both referred to the Committee on the Judiciary.

A companion resolution, S. Con. Res. 79 (Magnuson and Jackson), was submitted April 15, 1964 in the Senate; referred to the Committee on the Judiciary. The remarks of Senator Magnuson in submitting the resolution appear in the Congressional Record, pages 7858-7859.

HEALTH, EDUCATION, AND WELFARE APPROPRIATIONS, FY 1965: H. Rept. No. 1316, Department of Labor, and Health, Education, and Welfare, and Related Agencies Appropriation Bill, 1965 (April 10, 1964, report from the Committee on Appropriations, House of Representatives, 88th Congress, 2nd Session, to accompany H. R. 10809), 58 pp., printed. Included are funds for the Food and Drug Administration; also funds for the Public Health Service's environmental engineering and sanitation program, and water supply and water pollution control program. The environmental engineering and sanitation program is designed to assure that only safe water, milk, shellfish and other marine food, and food supplies are served to the public; and to provide for research on shellfish and other marine foods. The water pollution program provides for regional laboratories located in strategic points throughout the country to promote research and training activities and provide a base of action of State, interstate, and Federal agencies cooperating to eliminate water pollution.

INDIAN FISHING RIGHTS: S. J. Res. 170 and S. J. Res. 171 (Magnuson) introduced in Senate April 17, 1964, regarding Indian fishing rights; referred to Committee on Interior and Insular Affairs. The text of the resolutions together with remarks by Senator Magnuson were published in the Congressional Record, pages 8065-8067. Senator Magnuson stated that S. J. Res. 170 was introduced "to establish that State statutes, rules, and regulations relating to hunting and fishing shall be presumed to be necessary for conservation in certain areas. This would authorize State regulation of the time and manner of fishing outside an Indian reservation when such regulations are for the purpose of conservation and are equally applicable to all persons." Speaking in regard to S. J. Res. 171, Senator Magnuson said, in part, "I also introduce for appropriate reference a joint resolution on the same subject... . This second approach provides for the acquisition by the Secretary of the Interior of the Indian treaty rights to fish at all usual and accustomed places in common with other citizens... ."

INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT: After adopting an amendment thereto, the Senate on April 8, 1964, concurred in House amendment to S. 1605, a bill to amend the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, to provide for labeling of economic poisons with registration numbers, to eliminate registration under protest, and for other purposes. The amendments (concerning registration and review procedures for decisions on registration) and a statement by Senator Ribicoff on S. 1605 and the amendments were published in the Congressional Record, pages 6967-6969, April 8, 1964.

On March 26, 1964, Senator Ribicoff spoke from the floor of the Senate on the subject of pesticide buildup in water sources. In his remarks, he mentioned announcements by the U. S. Public Health Service and the State of Louisiana concerning water pollution involving pesticides which appears to be the cause of fish kills in the lower Mississippi drainage basin and its estuarine waters in the Gulf of Mexico. The Senator also mentioned the placing of three widely used pesticides under "severe restrictions" by the British Ministry of Agriculture, Fisheries, and Food. In his remarks, Senator Ribicoff inserted a statement by the U. S. Public Health Service, a letter from the Louisiana State Board of Health, and several newspaper articles discussing the effects of pesticides. (Congressional Record, page 6250, March 26, 1964.)

On April 2, 1964, Senator Ribicoff spoke from the floor of the Senate on the fish kills in Louisiana which have been attributed to pesticides. The Senator announced that public hearings on the buildup of pesticides in water resources and the general environment would be held by the Subcommittee on Reorganization and International Organizations of the Senate Committee on Government Operations. The hearings began April 7, 1964, when testimony was received from officials of the Department of Health, Education, and Welfare. On April 8, 1964, officials of the Interior Department, and the Food and Drug Administration testified. Subsequent sessions were devoted to testimony from Department of Agriculture officials, Federal Aviation Agency officials, state officials, and others.

INTERIOR APPROPRIATIONS, FY 1965: The Subcommittee of the Senate Committee on Appropriations met in executive session on April 1, 1964, and approved for full committee consideration with amendments H. R. 10433, making appropriations for the Department of the Interior and related agencies for the fiscal year ending June 30, 1965, and for other purposes. On April 4, 1964, the Senate Committee on Appropriations reported favorably, with amendments, H. R. 10433. On April 8, 1964, Senator Hayden filed 4 notices in writing of his intention to move to suspend the rules for the purpose of proposing amendments to H. R. 10433.

Interior Department and Related Agencies Appropriations for 1965 (Hearings before a Subcommittee of the Committee on Appropriations, United States Senate, 88th Congress, 2nd Session; on H. R. 10433), 1,611 pp., printed. Included are testimony, statements, and exhibits relating to funds for the Fish and Wildlife Service: the Office of the Commissioner, and its two bureaus, Commercial Fisheries and Sport Fisheries and Wildlife.

S. Rept. No. 971, Interior Department and Related Agencies Appropriation Bill, 1965 (April 4, 1964, report from the Committee on Appropriations, U. S. Senate, 88th Congress, 2nd Session, to accompany H. R. 10433), 43 pp., printed. Included are funds for the Fish and Wildlife Service: its two bureaus--Commercial Fisheries and Sport Fisheries and Wildlife--and the Office of the Commissioner.

For the Bureau of Commercial Fisheries, under management and investigations of resources, the Committee recommended an appropriation of $18,669,900, an increase of $837,000 over the House allowance, but a decrease of $1,961,100 from the budget estimate. (For management, the Committee recommended $490,734, an increase of $100,000 over the House allowance and the budget estimate. For research, the Committee recommended $11,908,200, an increase of $737,000 over the House allowance, and an increase of $138,900 over the budget estimate. For marketing and technology, the Committee recommended $4,457,500, the same as the House allowance, but a decrease of $75,000 from the budget estimate. The Committee concurred in the House allowances and budget estimates for the following: research on fish migration over dams--$1,396,700; fishing vessel mortgage insurance--$41,800; Columbia River fishery facilities--$2,249,900; and increased Pay Act costs--$250,066.) The Committee concurred in the action of the House proposing to transfer $2,125,000 from the Pribilof Islands fund to the "management and investigations of resources" activity. That transfer had not been provided for in the budget estimate.

The additions recommended by the Committee under "management and investigations of resources" are: $132,000 for acquisition of a vessel and additional reservoir research in South Dakota; $100,000 for more adequate management and enforcement of fishing regulations in international waters; $50,000 for initiation of a research program on shellfish processing and utilization at Ketchikan, Alaska; $325,000 for initiation of a research program on North Atlantic lobsters; and $230,000 for initiation of a program to survey and research the sea clam.

Also for the Bureau of Commercial Fisheries, the Committee concurred with the House allowance and budget estimate of $300,000 for the special foreign currency program. In addition, the Committee concurred with the House allowance and budget estimate of $4,788,000 for construction. (That will provide $1 million for the Shellfisheries Research Center at Milford, Conn.; $1.5 million for a biological research laboratory for the tropical Atlantic area; $1,350,000 for the first phase construction of an exploratory fishing vessel; $350,000 to equip a fishery research vessel for use in the North Pacific and Bering Sea; and $588,000 for conducting the Columbia River fishery facilities program.)

For the general administrative expenses of the Bureau of Commercial fisheries, the Committee recommended $667,000, the same as the House allowance, but a decrease of $9,000 from the budget estimate of $676,000.

For the Bureau of Sport Fisheries and Wildlife, the Committee recommended an appropriation of $50,989,300, an increase of $1,980,600 over the House allowance, and an increase of $3,353,300 over the budget estimate. The increases include additional funds for the construction of sport fish facilities, including fish hatcheries and fishery research facilities.

The Committee concurred with the House appropriation for the Office of the Commissioner of $425,000, an increase of $32,000 over the budget estimate.

INTERNATIONAL CONVENTION FOR THE NORTHWEST ATLANTIC FISHERIES: On April 1, 1964, the Senate received a copy of the protocol (Ex. B, 88th Cong., 2nd Sess.) to the International Convention for the Northwest Atlantic Fisheries signed at Washington, D. C., February 8, 1949, which protocol relating to harp and hood seals was signed at Washington, D. C., July 15, 1963, by the United States and 11 other governments; referred to the Committee on Foreign Relations.

OCEANOGRAPHY: H. R. 10904 (Wilson) introduced in House April 15, 1964, to establish the National Oceanographic Agency; referred to the Committee on Merchant Marine and Fisheries. The bill would establish a National Oceanographic Agency as an independent agency to establish a coordinated national program for oceanography and related sciences, including meteorology. All functions relating to oceanography now being carried out by separate agencies would be transferred to the National Oceanographic Agency. The remarks of Congressman Wilson in introducing the bill and the text of the bill appear in the Congressional Record, pages 7781-7782.

On March 23, 1964, the House received a communication from the President of the United States, relative to forwarding advance copies of two publications of the Federal Council for Science and Technology that set forth Government-wide plans and budget details entitled National Oceanographic Program, Fiscal Year 1965, Parts I and II; referred to the Committee on Merchant Marine and Fisheries.

Property rights, oceanography, and international law were discussed by Congressman Hanna under an extension of remarks on April 8, 1964 (Congressional Record, Appendix page A1728). Under an extension of remarks, Congressman Hanna commented on plans of the U. S. Navy to create an Institute of Naval Oceanology. A newspaper article discussing the Institute was inserted by the Congressman in the Congressional Record, Appendix page A1764, April 9, 1964.

A paper titled "Industry and the Economy of the Sea," delivered to the Governor's Conference on California and the World Ocean was inserted by Congressman King in the Congressional Record, pages 7612-7621, April 14, 1964.

SCHOOL-LUNCH PROGRAM USE OF IMPORTED PRODUCTS: S. 2694 (Miller) introduced in Senate March 25, 1964, to prevent schools participating in the school-lunch program under the National School Lunch Act from serving lunches containing any meat, poultry, or fish, or any product thereof, imported into the United States; referred to the Committee on Agriculture and Forestry. Senator Miller's statement of the need for the bill appeared in the Congressional Record, page 5977, March 25, 1964.

TRANSPORTATION AMENDMENTS OF 1964: On April 9, 1964, the House Committee on Rules deferred action on H. R. 9903, a bill to amend the Interstate Commerce Act and the Federal Aviation Act of 1958 so as to strengthen and improve the national transportation system, and to implement more fully the national transportation policy, and for other purposes.

VESSEL CONSTRUCTION SUBSIDY AMENDMENT: H. R. 10682 (McIntire) introduced in House April 6, 1964, to amend the act of June 12, 1960, for the correction of inequities in the construction of fish vessels, and for other purposes; referred to the Committee on Merchant Marine and Fisheries.

WATER RESOURCES COUNCIL: The Subcommittee on Irrigation and Reclamation of the House Committee on Interior and Insular Affairs held hearings March 24, 1964, on H. R. 3620 and S. 1111, similar bills, to provide for the optimum development of the Nation's natural resources through the coordinated planning of water and related land resources, through the establishment of a water resources council and river basin commissions, and by providing financial assistance to the States in order to increase State participation in such planning.

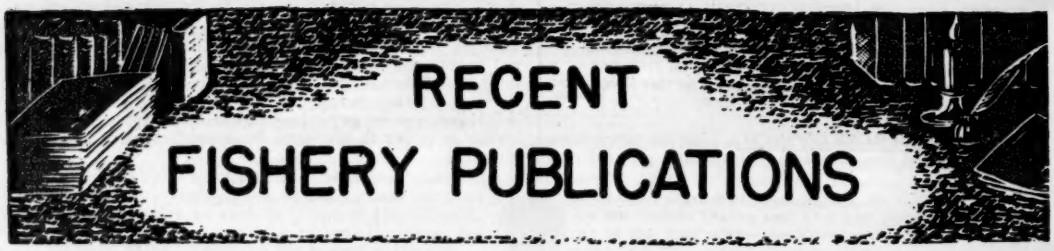
MARINE SCIENTISTS DRILL INTO OCEAN FLOOR

Scientists from the Institute of Marine Science, University of Miami, have succeeded in drilling 186 feet into the ocean floor at a depth of 2,000 feet at a Caribbean site southwest of Jamaica. Working from the 174-foot vessel Submarex, owned and operated by a California firm, and aided by the Institute of Marine Science Research vessel Gerda, the investigators anchored in deep water and obtained deep-sea sediments dating back some 20 million years. The operation constitutes the first phase of Project LOCO (Long Cores). Planned and directed by the Institute of Marine Science, with the cooperation of the California firm and the financial support of the National Science Foundation, the Miami investigators hope eventually to obtain continuous core samples of up to one-half mile in length from the ocean floor.

Sediment in deep-sea cores is dated by radioactive methods and by identifying tiny fossil shells embedded in it. About half the ocean floor is covered with a mud containing the empty shells of Foraminifera, tiny protozoans that live near the ocean surface. As the organisms die and sink, they contribute to the bottom sediment, known as Globigerina ooze, which accumulates at a rate of about one inch in a thousand years. When major changes occur at the earth's surface--such as when a large mountain range is created, an oceanic current shifts its course, or a major glaciation causes a lowering of temperatures--the character of the sediment and the types of shells buried in it change. Thus deep-sea sediments contain a unique record of the past history of the earth.

It is, of course, not easy to sample these sediments. One method, developed by Prof. Börje Kullenberg in Sweden during World War II and extensively used today involves the lowering to the sea floor of up to 60 feet of steel pipe by means of a steel wire. Iron weights, placed on top of the pipes, force them into the sediment and piston placed inside helps the sediment to enter from the bottom opening. The longest core ever raised by this method is 66 feet long. In order to reach and sample deeper sediments, drilling equipment must be used.

The California marine exploration firm of Los Angeles acquired considerable experience in drilling through the deep ocean floor when it conducted, more than two years ago, the first phase of the MOHO Project off the coast of southern California. The purpose of that project is essentially to sample the upper mantle, which underlies the crust of the earth at a depth of 3 to 4 miles below the ocean floor. The purpose of the Institute of Marine Science's LOCO Project, on the other hand, is to sample in continuity the sediments of the deep-sea floor, which are 1,000 to 3,000 feet thick, and to thus gain an insight into the past history of the earth.



FISH AND WILDLIFE SERVICE PUBLICATIONS

THESE PROCESSED PUBLICATIONS ARE AVAILABLE FREE FROM THE OFFICE OF INFORMATION, U. S. FISH AND WILDLIFE SERVICE, WASHINGTON, D. C. 20240. TYPES OF PUBLICATIONS ARE DESIGNATED AS FOLLOWS:

CFS - CURRENT FISHERY STATISTICS OF THE UNITED STATES.
FL - FISHERY LEAFLETS.
SEP.- SEPARATES (REPRINTS) FROM COMMERCIAL FISHERIES REVIEW.
SL - STATISTICAL LISTS OF DEALERS IN AND PRODUCERS OF FISHERY PRODUCTS AND BYPRODUCTS.
SSR. FISH. - SPECIAL SCIENTIFIC REPORTS--FISHERIES (LIMITED DISTRIBUTION.

Number	Title
CFS-3405	California Landings, October 1963, 4 pp.
CFS-3407	Mississippi Landings, October 1963, 3 pp.
CFS-3408	Mississippi River Fisheries, 1962 Annual Summary, 9 pp.
CFS-3409	Mississippi Landings, November 1963, 3 pp.
CFS-3414	North Carolina Landings, December 1963, 4 pp.
CFS-3415	New Jersey Landings, November 1963, 4 pp.
CFS-3416	New Jersey Landings, December 1963, 3 pp.
CFS-3420	Michigan Landings, November 1963, 3 pp.
CFS-3423	Ohio Landings, November 1963, 3 pp.
CFS-3424	Ohio Landings, December 1963, 3 pp.
CFS-3425	Alabama Landings, December 1963, 4 pp.
CFS-3426	Fish Meal and Oil, December 1963, 2 pp.
CFS-3428	Maryland Landings, December 1963, 4 pp.
CFS-3429	Ohio Landings, 1963 Annual Summary, 4 pp.
CFS-3430	Louisiana Landings, December 1963, 3 pp.
CFS-3431	Georgia Landings, January 1964, 2 pp.
CFS-3432	North Carolina Landings, January 1964, 4 pp.
CFS-3433	Virginia Landings, December 1963, 4 pp.
CFS-3434	South Carolina Landings, January 1964, 2 pp.
CFS-3435	New York Landings, December 1963, 4 pp.
CFS-3437	Florida Landings, January 1964, 7 pp.
CFS-3439	Shrimp Landings, September 1963, 8 pp.
CFS-3450	Advance Report on the Fisheries of the United States, 1963, 23 pp.

Wholesale Dealers in Fishery Products (Revised):

SL-24	Minnesota (Great Lakes Area), 1963, 1 p.
SL-26	Illinois (Great Lakes Area), 1963, 2 pp.
SL-27	Indiana (Great Lakes Area), 1962, 1 p.
SL-33	North Dakota (Mississippi River and Tributaries), 1962, 1 p.
SL-37	Kansas (Mississippi River and Tributaries), 1962, 1 p.

Sep. No. 702 - Lake Erie Fisheries Explorations, May-November 1960.

FL-481 - The Use of Aquatic Plants in the Home Aquarium, 4 pp., revised, May 1963.

FL-552 - Estimated Federal Income Tax Procedure for Commercial Fishermen: Questions and Answers, by DeVora R. Alexander, 6 pp., October 1963.

FL-562 - Sacramento River Chinook Disease (SRCD), by Thomas J. Parisot, 2 pp., October 1963.

SSR-Fish. No. 422 - Records and Observations from Plankton Grid Studies off Baja California, April 1952, by David Kramer, 44 pp., illus., September 1963.

SSR-Fish. No. 444 - Northeast Pacific Albacore Oceanography Survey, 1961, by R. W. Owen, Jr., 40 pp., illus., November 1963.

SSR-Fish. No. 445 - Factors Influencing the Return of Fall Chinook Salmon (Oncorhynchus tshawytscha) to Spring Creek Hatchery, by Charles O. Junge, Jr. and Lloyd A. Phinney, 36 pp., illus., June 1963.

SSR-Fish. No. 448 - Crab Larvae (Callinectes), in Plankton Collections from Cruises of M/V Theodore N. Gill, South Atlantic Coast of the United States, 1953-54, by Paul R. Nichols and Peggy M. Keney, 17 pp., illus., October 1963.

SSR-Fish. No. 450 - Molt in the Northern Fur Seal, by Victor B. Schaeffer and Ancel M. Johnson, 38 pp., illus., October 1963.

SSR-Fish. No. 451 - A Method for Tagging Immature Herring, by John E. Watson, 7 pp., 1963.

SSR-Fish. No. 455 - Counts of Red-Tide Organisms, Gymnodinium breve, and Associated Oceanographic Data from Florida West Coast, 1960-61, by Alexander Dragovich and others, 43 pp., illus., October 1963.

SSR-Fish. No. 473 - Economic Survey of the U. S. Fisheries in the Passamaquoddy Region, 1956-57, by Giulio Pontecorvo and Leslie W. Scattergood, 18 pp., illus., December 1963. The proposed Passamaquoddy Project would be built in an area important for its fisheries. An economic survey of the primary and secondary fisheries of the area has been made. In the primary fishery, the herring was most important; clams and scallops were quite valuable; groundfish, anadromous and catadromous fish, and lobsters were of minor importance. Average value of herring landings in 1948-57 was $102,000; clams, $60,000; scallops, $15,000; and the remaining species all less than $5,000. In the Project area 24 weirs, 7 stop seiners, and 16 carriers operated. Detailed information on investments, operating costs, and profits

is presented. The secondary survey covered the herring-processing industry whose 20 plants manufactured $11 million worth of products.

Annual Report for 1962, Branch of Fishery Management Services, by Edward C. Kinney, 39 pp., illus., 1963.

THE FOLLOWING ENGLISH TRANSLATION OF A FOREIGN LANGUAGE ARTICLE IS AVAILABLE ONLY FROM THE U. S. BUREAU OF COMMERCIAL FISHERIES, 101 SEASIDE AVE., TERMINAL ISLAND, CALIF.

Fishing Vessel Management from "Review of the (Japanese) Tuna Fishery," by Shoichi Masuda, Translation Series No. 7, 28 pp., processed, February 1964. (Translated from the Japanese, Review of the (Japanese) Tuna Fishery, Chap. VI, Sec. B, Item 3, pp. 390-410.)

THE FOLLOWING SERVICE PUBLICATIONS ARE AVAILABLE ONLY FROM THE SPECIFIC OFFICE MENTIONED.

(Baltimore) Monthly Summary--Fishery Products, November and December 1963, 8 pp. ea. (Market News Service, U. S. Fish and Wildlife Service, 103 S. Gay St., Baltimore, Md. 21202.) Receipts of fresh- and salt-water fish and shellfish at Baltimore by species and by states and provinces; total receipts by species and comparisons with previous periods; and wholesale prices for fresh fishery products on the Baltimore market; for the months indicated.

California Fishery Market News Monthly Summary, Part II, Fishing Information, February 1964, 21 pp., illus. (U. S. Bureau of Commercial Fisheries, Biological Laboratory, P. O. Box 6121, Pt. Loma Station, San Diego, Calif. 92100.) Contains sea-surface temperatures, fishing and research information of interest to the West Coast tuna-fishing industry and marine scientists; for the month indicated. Includes information on the U. S. Navy picket vessel albacore catch for 1963. In continuation of the cooperative trolling program which was started in 1960, the U.S. Navy logged albacore catches at each of its radar early warning surveillance stations off the west coast of the United States. The catch for 1963 was the highest for any one year since inception of the program. A total of 1,041 albacore was taken by the picket fleet. The estimated weight of this catch is about 10,858 pounds, or 5.4 tons. For the fourth consecutive year, distribution and availability of albacore off the U. S. west coast has exhibited a striking correlation with prevailing sea surface temperatures.

Frozen Mexican (West Coast) Shrimp Prices, 1959-1963, 7 pp. (Market News Service, U. S. Fish and Wildlife Service, Rm. 208, Post Office Bldg., San Pedro, Calif. 90731.)

List of Primary Receivers of Imported Fishery Products and Byproducts at New Orleans, La., 1964, 4 pp., March 1964. (Market News Service, U.S. Fish and Wildlife Service, Rm. 609, 600 South St., New Orleans, La. 70130.)

Monthly Summary of Fishery Products Production in Selected Areas of Virginia, North Carolina, and Maryland, February 1964, 4 pp. (Market News Service, U. S. Fish and Wildlife Service, 18 S. King St., Hampton, Va. 23369.) Landings of food fish and shellfish and production of crab meat and shucked oysters for the Virginia areas of Hampton Roads, Chincoteague, Lower Northern Neck, and Lower Eastern Shore; the Maryland areas of Crisfield, Cambridge, and Ocean City; and the North Carolina areas of Atlantic, Beaufort, and Morehead City; together with cumulative and comparative data on fishery products and shrimp production; for the month indicated.

New England Fisheries--Monthly Summary, January and February 1964, 24 pp. each. (Market News Service, U. S. Fish and Wildlife Service, 10 Commonwealth Pier, Boston, Mass. 02210.) Review of the principal New England fishery ports. Presents data on fishery landings by ports and species; industrial-fish landings and ex-vessel prices; imports; cold-storage stocks of fishery products in New England warehouses; fishery landings and ex-vessel prices for ports in Massachusetts (Boston, Gloucester, New Bedford, Provincetown, and Woods Hole), Maine (Portland and Rockland), Rhode Island (Point Judith), and Connecticut (Stonington); frozen fishery products prices to primary wholesalers at Boston, Gloucester, and New Bedford; and Boston Fish Pier and Atlantic Avenue fishery landings and ex-vessel prices by species; for the months indicated.

New York City's Wholesale Fishery Trade--Monthly Summary--January 1964, 16 pp. (Market News Service, U. S. Fish and Wildlife Service, 155 John St., New York, N. Y. 10038.) Includes summaries and analyses of receipts and prices on wholesale Fulton Fish Market, including both the salt- and fresh-water sections; imports entered at New York customs district; primary wholesalers' selling prices for fresh, frozen, and selected canned fishery products; marketing trends; and landings at Fulton Fish Market docks and Stonington, Conn.; for the month indicated.

Seattle--Landings, Receipts, and Value of Fishery Products, 1963, by Charles M. Reardon, 37 pp., March 1964. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Reviews Pacific Northwest fisheries trends and their effect upon Seattle fishery receipts for 1963. Contains statistical tables on landings by U. S. halibut fleet; Seattle's landings and receipts of fishery products; carload and truckload shipments of fishery products by months; imports of canned fishery products; receipts of Alaska canned fish and shellfish; and names, classifications, and approximate standards as used on Seattle Wholesale Market. Also presents data on receipts of fresh and frozen fish and shellfish; fresh and frozen salmon receipts and imports; ex-vessel landings and prices of fish by the otter-trawl fleet; Puget Sound canned salmon pack; and related information.

(Seattle) Washington and Alaska Receipts and Landings of Fishery Products for Selected Areas and Fisheries, Monthly Summary, February 1964, 6 pp. (Market News Service, U. S. Fish and Wildlife Service, 706 Federal Office Bldg., 909 First Ave., Seattle, Wash. 98104.) Includes Seattle's landings by the halibut and salmon fleets reported through the exchanges; landings of halibut reported by the International Pacific Halibut Commission; landings of otter-trawl vessels as reported by the Fishermen's Marketing Association of Washington; local landings by independent vessels; coastwise shipments from Alaska by scheduled and non-scheduled shipping lines and airways; imports from British Columbia via rail, motor truck, shipping lines, and ex-vessel landings; and imports from other countries through Washington customs district; for the month indicated.

THE FOLLOWING SERVICE PUBLICATION IS FOR SALE AND IS AVAILABLE ONLY FROM THE SUPERINTENDENT OF DOCUMENTS, U. S. GOVERNMENT PRINTING OFFICE, WASHINGTON, D. C. 20402.

The Natural Resources of Ohio, 59 pp., illus., printed, 45 cents, 1963. Includes sections discussing the fish and wildlife resources of Ohio and the program of the U. S. Fish and Wildlife Service in that State.

MISCELLANEOUS PUBLICATIONS

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM. CORRESPONDENCE REGARDING PUBLICATIONS THAT FOLLOW SHOULD BE ADDRESSED TO THE RESPECTIVE ORGANIZATIONS OR PUBLISHER MENTIONED. DATA ON PRICES, IF READILY AVAILABLE, ARE SHOWN.

ALASKA:

Progress Report for the Years 1960-1961-1962, Report No. 12, 82 pp., illus., printed. Alaska Department of Fish and Game, Juneau, Alaska. Reports on accomplishments of the Alaska Department of Fish and Game since statehood was acquired on January 1, 1960. The report discusses the harvest and its values, research, development, regulatory management, support functions and activities, and organization. Appendixes contain data on harvests and values for commercial fisheries, development projects, and publications and films.

ALGAE:

A Culture Method for Marine Diatoms and Flagellates, by B. Wisely and C. Purday, 7 pp., illus., printed. (Reprinted from Tuatara, vol. 11, no. 1, March 1963, pp. 20-26.) Commonwealth Scientific and Industrial Research Organization, Marine Laboratory, Cronulla, N. S. W., Australia.

Some New Records and Range Extensions of Florida Marine Algae, by Harold J. Humm, Contribution no. 504, 11 pp., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 13, no. 4, December 1963, pp. 516-526.) Institute of Marine Science, 1 Rickenbacker Causeway, Miami 49, Fla.

ANCHOVIES:

"Anchovy Fishing Off the Chilean Coast," article, The South African Shipping News and Fishing Industry Review, vol. XIX, no. 1, January 1964, pp. 79, 81, 83, 85, illus., printed, single copy 30¢ (about 45 U. S. cents). Thomson Newspapers, South Africa (Pty.) Ltd., 8th Floor, Trust House, Thibault Sq., Box 80, Cape Town, South Africa Republic. Describes the operations of the Iquique fleet of 60 purse-seiners ranging in size from 45 to 85 feet, of both wood and steel construction; separators in the fish oil plant; factory power transmission; stickwater pumps; and pumps on the jetty.

BARRACUDA:

"New Light on an Ocean Killer," article, New Scientist, vol. 21, no. 375, January 23, 1964, p. 200, illus., printed, single copy 1s. 3d. (about 20 U.S. cents). Cromwell House, Fulwood Pl., High Holborn, London WC1, England.

BEAKED FISH:

The Beaked Fishes of Maryland, by Frank Schwartz, Educational Series No. 54, 4 pp., illus., printed. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

BERING SEA:

Peculiarities of Ichthyofauna Distribution in Southeast Bering Sea, USSR, by V. P. Shuntov, OTS 63-31519, 20 pp., illus., printed, August 13, 1963, 50 cents. Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

BIOCHEMISTRY:

"Studies on the External Mucous Substance of Fishes. 8--Quantitative Analysis of the Mucus-Polysaccharide from Some Fishes," by N. Enomoto and others, article, Nihon Suisan Gakkai-shi, vol. 29, no. 6, June 1963, pp. 542-545, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

BIOLOGICAL RESEARCH:

Chesapeake Biological Laboratory, Its Facilities, History and Program, Educational Series No. 62, 34 pp., illus., printed, January 1964. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md. Describes in detail the physical facilities of the Chesapeake Biological Laboratory, Solomons, Md.; the history of the Laboratory since its founding in 1924 by Dr. R. V. Truitt; its present staff and program; accomplishments in both practical and academic studies; and goals for the future.

BRAZIL:

Establishing a Business in Brazil, by Gertrude Heare and William Frohlich, OBR 63-149, 24 pp., printed 15 cents, December 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) Foreign investments in Brazil have been fostered since 1955 by the existence of provisions encouraging the importation of capital equipment, licensed without exchange cover, as a direct foreign investment. This report discusses Government policy on investment, entry and repatriation of capital, tariff concessions to industry, and business organization. Also covers patents, copyrights, and trade marks; regulations affecting employment; taxation; and United States tax aspects of Brazilian investments.

Foreign Trade Regulations of Brazil, OBR 63-150, 12 pp., printed, 15 cents, December 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) Import substitution, protection of newly-established factories, and restriction on the purchase of foreign exchange are the methods used by Brazil to achieve its foreign trade policy aims. The report discusses Brazil's trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, Brazil's export controls, United States foreign trade controls, and diplomatic representation between the two countries.

BYPRODUCTS:

Fish from the Port of Gloucester to Your Feed Mill, by Raymond N. Allen, 4 pp., illus., printed. (Reprinted from Eastern Feed Merchant, March 1960.) New

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England By-Products Corp., 28 Church St., Winchester, Mass. The processing of industrial fishery products and byproducts plays an important role in formulating fees for poultry, turkeys, and swine. This article discusses the processing of inedible portions of ocean perch into fish meal, oil, and solubles. Also covers briefly the history of the Gloucester fishing industry and its present operation.

"Ovenstone-INDUS Factory in Chile is Now in Full Operation," article, The South African Shipping News and Fishing Industry Review, vol. XIX, no. 1, January 1964, pp. 67, 69, 73, 77, illus., single copy 30¢ (about 45 U. S. cents). Thomson Newspapers, South Africa (Pty.) Ltd., 8th Floor, Trust House, Thibault Sq., Box 80, Cape Town, South Africa Republic. Discusses the fish meal and fish body oil plant at Iquique, Chile, jointly financed and operated by Ovenstone South West Investments Ltd. and Chile's Compania Industrial. Describes the history of the joint venture and the operations of the plant. Much of the equipment and even the building itself were constructed in South-West Africa. Plans are already being made to double its present capacity of 50 metric tons of fish an hour.

CALIFORNIA:

California Fish and Game, vol. 50, no. 1, January 1964, 66 pp., illus., printed, single copy 75 cents. Printing Division, Documents Section, Sacramento, Calif., 95814. Includes, among others, these articles: "The Sand Shark, Carcharias ferox (Risso), in California," by Anita E. Daugherty; "An Experimental Study to Control Oyster Drills in Tomales Bay, California," by C. Irwin Haydock; "Underwater Tagging Gun," by Earl E. Ebert; "Notes on the Life History and a Description of the Sharpnose Seaperch, Phanerodon atripes (Jordan and Gilbert)," by J. Gary Smith; "Landings Estimates of California's Marine Recreational Salmon Fishery," by Paul T. Jensen; and "Observations on Spawning Pacific Sardines," by Robert S. Wolf.

The California Marine Fish Catch for 1962, Fish Bulletin 125, 44 pp., illus., printed, 1964. Office of State Printing, Documents Section, P. O. Box 1612, Sacramento, California, 95807. A summary of the 1962 landings of the California commercial fishing fleet, the imports from other states or foreign countries of fresh fish received for processing, and the catches of the partyboat fleet. Statistical data cover landings and shipments of leading species, by weight and value; annual landings and shipments, 1916 through 1962; number of licensed commercial fishermen; number of registered fishing vessels by length; and origin of shipments, 1962. Also included are data on origin of commercial fish landings, 1962; monthly landings and shipments, 1962, by areas and statewide; value and poundage, annual landings and shipments by areas, 1962; value of landings and shipments by ports and areas, 1962; partyboat sport catch, 1953-62; and live bait catch, 1962.

State of California Fish and Game Code, 1963, compiled by Monica O'Brien, 292 pp., illus., printed. Department of Fish and Game, 722 Capitol Mall, Sacramento, Calif. 95814. Covers provisions of this code relating to the taking, processing or use of birds, mammals, fish, mollusks, crustaceans, amphibians, or reptiles. Also covers some provisions which relate or apply to or affect the taking, processing or use of fish, mollusks, crustaceans, kelp and other aquatic plants for commercial purposes. Discusses the organization and functions of the Fish and Game Commission and the Department of Fish and Game. Includes, among others, a section on commercial fishing which covers provisions pertaining to particlular species of fish and shellfish--sardines, anchovies, salmon, lobster, crab, abalones, clams and other mollusks, saltwater and anadromous fish, fresh-water fish, and fresh-water fish used for bait.

CANADA:

Annual Report 1963, 20 pp., printed, 1963. Fishermen's Co-Operative Association, Prince Rupert, B. C., Canada.

British Columbia Catch Statistics, 1963 (By Area and Type of Gear), 203 pp., illus., processed, February 5, 1964. Department of Fisheries of Canada, 1155 Robson St., Vancouver 5, B. C., Canada. The thirteenth annual report of fish-catch statistics for British Columbia based on Departmental copies of sales slips that are completed by all commercial fish buyers operating within the Province. The report is divided into three sections: (1) summary of landings by district and total landed value of all fish; (2) highlights of catch statistics--a general review of significant events in the salmon fishery and a review for other species; and (3) detailed district and area monthly statistics by type of gear. Certain economic, weather, and conservation factors that have a bearing on the catch are also reviewed.

Federal-Provincial Conference on Fisheries Development, January 20-24, 1964, Background Papers, 107 pp., printed, 1963. Department of Fisheries, Ottawa, Canada.

Journal of the Fisheries Research Board of Canada, vol. 20, no. 6, November 1963, 224 pp., illus., printed, single copy C$2. Queen's Printer, Ottawa, Canada. Includes, among others, articles on: "Body Fluid Regulation in Smolting Atlantic Salmon," by Arthur H. Houston and Lawrence T. Threadgold; "On the Problem of Maximum Yield from North Pacific Sockeye Salmon Stocks," by Robert R. Parker; "Studies on the Life History and Ecology of the Bigmouth Buffalo, Ictiobus cyprinellus (Valenciennes)," by R. P. Johnson; "Use of Coloured Tags in Fish Population Estimates," by G. H. Lawler and G. F. M. Smith; "2-Phenoxyethanol as a General Anaesthetic for Sockeye Salmon," by H. S. Sehdev, J. R. McBride, and U. H. M. Fagerlund; "Effects of Formalin on Length and Weight of Fishes," by Robert R. Parker; "Olfactory Perception in Migrating Salmon. III--Stimulants for Adult Sockeye Salmon (Oncorhynchus nerka) in Home Stream Waters," by U. H. M Fagerlund and others; "Fecundity of Grand Bank Haddock," by V. M. Hodder; and "Minke Whales, Balaenoptera acutorostrata Lacepede, of the Western North Atlantic," by D. E. Sergeant.

Journal of the Fisheries Research Board of Canada, vol. 21, no. 1, January 1964, 215 pp., illus., printed, single copy C$2. Queen's Printer, Ottawa, Canada. Includes, among others, articles on: "Laboratory Observations on Embryonic Development and Larvae of the Pacific Cod (Gadus macrocephalus Tilesius)," by

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

C. R. Forrester; "Lethal Concentrations of Copper and Zinc for Young Atlantic Salmon," by J. B. Sprague; "Movements of Young Atlantic Salmon in a Small Stream," by Richard L. Saunders and John H. Gee; "Ultraviolet Irradiation of Circulating Refrigerated Fish Storage Brines," by J. W. Boyd and B. A. Southcott; "Variations in the Growth of Atlantic Cod (Gadus morhua L.)," by A. C. Kohler; "Polyphosphate Treatment of Frozen Cod. I--Protein Extractability Lipid Hydrolysis," by W. J. Dyer and others; "Water-Thawing of Frozen Cod Blocks," by W. A. MacCallum and D. G. Ellis; "Activity Cycles in the Brown Trout (Salmo trutta L.). 2--Fish Artifically Fed," by D. R. Swift; and "Observations on Herring Spawning Off Southwest Nova Scotia," by R. A. McKenzie.

Report and Recommendations of the Newfoundland Fisheries Commission to the Government of Newfoundland, April, 1963, 123 pp., printed, 1963. Newfoundland Fisheries Commission, St. John's, Newfoundland, Canada.

33rd Annual Report, 1962, Department of Fisheries, 137 pp., illus., printed, 1963. Queen's Printer and Controller of Stationery, Ottawa, Canada. Presents the functions and activities of the Department of Fisheries for the year 1962, and the financial statements of the Department for the fiscal year 1962/63. Covers in detail the activities of the Department's Conservation and Development Service, Protection Branch's patrol vessels, Inspection Service, Economics Service, Information and Consumer Service, and Industrial Development Service. Also covers the Fishermen's Indemnity Plan, and activities of the Fisheries Prices Support Board, Fisheries Research Board of Canada, international commissions, and special committees. Canada's Pacific and Atlantic Coast and lake fisheries are also discussed. Statistics cover the quantity and value of fish and shellfish landed, exports by type of product, number of fishermen in Canada, and value of vessels and gear. The appendix contains financial statements for fiscal year 1962/63, and statements on fish-culture development.

CANNING:

"Canned Sprats and Herrings as Well as Salmon Substitutes in Oil Flavored with Smoke Extracts, by B. Schobler, article, Fischerei-Forschung, vol. 5, no. 4, 1962, pp. 13-15, printed in German. Institut fur Hochseefischerei und Fischverarbeitung, Rostock-Marienehe, Germany.

CARP:

Why Destroy the European Carp?, by A. Dunbavin Butcher, Fisheries Circular No. 6, 10 pp., illus., processed, 1962. Fisheries and Wildlife Department, 605 Flinders St., Melbourne C2, Australia.

CHESAPEAKE BAY:

Data from Virginia-Maryland Cooperative Fish Trawl Surveys in Chesapeake Bay, 1957 and 1958, by William H. Massmann and Romeo J. Mansueti, Special Scientific Report No. 42, 21 pp., printed, 1963. Institute of Marine Science, Gloucester Point, Va.

Effects of Civilization on Striped Bass and Other Estuarine Biota in Chesapeake Bay and Tributaries, by Romeo J. Mansueti, Contribution No. 191, 17 pp., illus., printed. (Reprinted from Proceedings of the Gulf and Caribbean Fisheries Institute, Fourteenth Annual Session, November 1961, pp. 110-136.) Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

CLAMS:

Effect of an Introduced Clam (CORBICULA) on Water Quality in the Tennessee River Valley, by Ralph M. Sinclair, 14 pp., illus., processed, 1963. Tennessee Stream Pollution Control Board, Tennessee Department of Public Health, 620 Cordell Hull Bldg., Nashville, Tenn.

COD:

Longlining Experiments for Cod off the East Coast of Newfoundland and Southern Labrador, 1950-1955, by Wilfred Templeman and A. M. Fleming, Fisheries Research Board Bulletin 141, printed, $1.50. Queen's Printer, Ottawa, Canada.

"Quality Changes in Stored Refrozen Cod Fillets," by W. J. Dyer and others, article, Bulletin, Institut International du Froid, vol. 1, Annexe 1962, pp. 1-9, illus., printed in French. Institut International du Froid, 177 Boulevard Malesherbes, Paris XVII, France.

Sedimentation and Aggregation of Cod Myosin: A Re-Appraisal, by J. J. Connell, Torry Memoir No. 148, 11 pp., printed, 1963. (Reprinted from Biochimica et Biophysica Acta.) Torry Research Station, Aberdeen, Scotland.

COMMISSIONS:

(Atlantic States Marine Fisheries Commission) Minutes of the 22nd Annual Meeting (September 24-26, 1963, Boston, Mass.), 181 pp., illus., processed, limited distribution. Atlantic States Marine Fisheries Commission, 336 E. College Ave., Tallahassee, Fla., 32301. Covers the minutes of the 22nd annual meeting of the Commission with details of attendance; the first, second, third, and fourth general sessions; and section meetings of the North Atlantic, Middle Atlantic, Chesapeake Bay, and South Atlantic Sections. Also includes accounts of the individual section meetings, resolutions recommended for adoption, and the executive committee and biological committee meetings. Appendices include, among others, reports on the technological committee meeting, Commercial Fisheries Research and Development Act of 1963, developments in Washington on fisheries legislation, seasonal abundance of juvenile pink shrimp in the nursery grounds, and preserving the fisheries of estuarine waters. Also included in the appendices are reports on legislation and resource conservation, pesticide research, the Cooperative Program for the Certification of Interstate Shellfish Shippers--1963, evaluation of commercial and sport fisheries of the Atlantic Coast, and Soviet fishing activity along the East Coast of the United States during 1963.

COPEPODS:

A Study of the Temperature Factor in Twelve Species of Oceanic Copepods, by Hilary B. Moore and Maria Foyo, Contribution no. 503, 14 pp., illus., printed. (Reprinted from Bulletin of Marine Science of the Gulf and Caribbean, vol. 13, no. 4, December 1963,

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

pp. 502-515.) Institute of Marine Science, 1 Rickenbacker Causeway, Miami 49, Fla.

COSTA RICA:

Foreign Trade Regulations of Costa Rica, by Rodney D. Anderson, OBR 63-155, 8 pp., printed, 15 cents, December 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C., 20402.) Basic goals of the Central American Common Market, of which Costs Rica is in the process of becoming a member, are: (1) the diversification of production for both the domestic and foreign markets, which also will serve to stabilize Central American exchange earnings as well as the domestic economy; and (2) the development of a broader internal market, thereby enabling domestic industries to take advantage of economies of scale. The report presents information on Costa Rica's trade policy, import tariff system, sales and other internal taxes, documentation and fees, and labeling and marking requirements. Also covers special customs provisions, nontariff import trade controls, export controls, United States foreign trade controls, and diplomatic representation between the two countries.

CRAYFISH:

Crayfishes of the Cheat River Watershed in West Virginia and Pennsylvania. Part II--Observations upon Ecological Factors Relating to Distribution, by Frank J. Schwartz and William G. Meredith, Contribution No. 207, 14 pp., illus., printed. (Reprinted from The Ohio Journal of Science, vol. 62, no. 5, September 1962, pp. 260-273.) Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

Ecological Population Expansion of the Introduced Crayfish, ORCONECTES VIRILIS, by Frank J. Schwartz, Robert Rubelmann, and James Allison, Contribution No. 233, 8 pp., illus., printed. (Reprinted from the Ohio Journal of Science, vol. 63, no. 6, November 1963, pp. 268-273.) Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

DEPARTMENT OF THE INTERIOR:

Annual Report 1963, The Secretary of the Interior (For the Fiscal Year Ending June 30, 1963), 490 pp., illus., printed, $1.75, 1964. U. S. Department of the Interior, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) The activities of the Department's bureaus and offices, including the U.S. Fish and Wildlife Service (and its two Bureaus--Commercial Fisheries and Sport Fisheries and Wildlife), are summarized in this report.

DOLPHIN:

"Studies on Fishing Conditions of the Dolphin, Coryphane hippurus L., in the Western Region of the Japan Sea. 8--Comparison of Juvenile Fish Fauna in the Sea and in the Stomachs of Dolphin," by S. Kojima, article, Nihon Suisan Gakkai-shi, vol. 29, no. 6, June 1963, pp. 507-513, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

DRIED FISH:

"Relationship between Relative Humidity and Moisture Absorbed in Dried Fish Products," by M. Takei, article, Nihon Suisan Gakkai-shi, vol. 29, no. 6, June 1963, pp. 525-530, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

EAST AFRICA:

Annual Report 1962, 20 pp., printed, 1963. East African Marine Fisheries Research Organization, Zanzibar, Zanzibar.

ECOLOGY:

Effects of Winter Water Conditions on Two Species of Marine Fishes, by Frank J. Schwartz, Contribution No. 241, 2 pp., printed. (Reprinted from Ecology, vol. 44, no. 3, Summer 1963, pp. 622-623.) Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

Results and Prospects of Acclimatization of Fish and Invertebrates to Water Bodies of USSR, OTS 63-41075, 21 pp., printed, 50 cents, November 6, 1963. Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

Some Problems on the Reproductive Ecology of Marine Bottom Invertebrates with Pelagic Development, by S. A. Mileikovskii, Translations No. 100, 27 pp., printed, 1963. Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, Suffolk, England.

ELECTRIC TRAWLING:

"Elektrotraly" (Electric Trawls), by V. A. Shentiakov, article, Rybnoe Khoziaistvo, vol. 38, no. 4, 1962, pp. 47-55, illus., printed. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U. S. S. R.

EL SALVADOR:

Basic Data on the Economy of El Salvador, by Thomas K. Brewer, OBR 63-145, 24 pp., printed, 15 cents, December 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) A report on the economy of El Salvador, smallest of the Latin American Republics. The Government established a Council for Economic Planning and Coordination in May 1962. The aims of the Council are to plan and coordinate the economic activities of the nation toward maximum orderly and continuous growth and to achieve a better standard of living for all the people by broadening opportunities of progress and welfare. The report discusses some general information on geography, climate, government, and population; structure of the economy; agriculture; forestry and mining; industry; power; transportation; communications; finance; foreign trade; economic development; and diplomatic representation between the United States and El Salvador. A section on fishing discusses the shrimp fishery, the fishery for tuna and other species, and the fishing law of 1955. Also included are a number of statistical tables including one giving data on U.S. imports of Salvadoran shrimp, 1957-1962.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

EUROPEAN FREE TRADE ASSOCIATION:

Third Annual Report of the European Free Trade Association for the Period 1st July, 1962-30th June, 1963, 46 pp., illus., printed, July 1963. Secretariat, European Free Trade Association, Geneva, Switzerland. (Available from the Washington Information Office, European Free Trade Association, 711 14th St. NW., Washington, D. C., 20005.) Discusses principal accomplishments of the EFTA during the year, internal activities of the Association, organization of EFTA, relations with other organizations, economic developments in EFTA in 1962/63, Association agreement with Finland, and amendments and implementation of the EFTA Convention. By the end of 1962 the intra-EFTA tariffs on industrial goods had been reduced by 50 percent. In May 1963, decisions were taken which will mean that by the end of 1966 all obstacles to the free movement within EFTA of goods covered by the Convention will have been abolished. Included in the report is a section on the Association's actions to facilitate an expansion of trade in fish and other marine products which will provide reasonable reciprocity to Member States whose economies depend to a great extent on exports of those products.

FISH DETECTION:

"Measurement of the Dimensions of Fish to Facilitate Calculations of Echo Strength in Acoustic Fish Detection," by R. W. G. Haslett, article, Journal du Conseil, vol. 27, 1962, pp. 261-269, illus., printed. Conseil Permanent International Pour l'Exploration de la Mer, Charlottenlund-Slot, Denmark.

FISHERIES RESEARCH:

"Discovery: Britain's Sea-Going Research Laboratory," article, New Scientist, vol. 17, no. 323, 1963, pp. 117-179, illus., printed. Harrison, Raison and Co., Ltd., Cromwell House, Fulwood Place, High Holborn, London WC1, England.

International Collaboration in Fisheries Research, by C. E. Lucas, Marine Reprint No. 214, 18 pp., printed, 1963. Department of Agriculture and Fisheries for Scotland, Marine Laboratory, Aberdeen, Scotland.

FISHERY DEVELOPMENT:

"Problems of Fishery Development in Primitive Communities," by R. S. Rack, article, Proceedings of the Nutrition Society, vol. 21, no. 1, 1962, pp. 114-120, printed. Cambridge University Press, 200 Euston Road, London NW1, England.

FISH MEAL:

"Fish Waste for Feeding Pigs. II--Comparison of Digestibility and Utilization of Nutrients of Fishmeal and Fish Silage," by C. Lewicki and M. Wojciak, article, Roczniki Nauk Rolniczych, vol. 79, 1962, pp. 221-227, printed in Polish with Russian and English summaries. Instytut Rybactaw Srodladowego, Palace Tultury Nauki, 27 Pietro, Pokoj 2719, Poland.

"Hydrolysed Fodder Yeast and Fishmeal in Rations for Pregnant Sows," by I. I. Ismailov, article, Svinovodstro, no. 2, 1962, pp. 36-37, printed in Russian. Akedmiia, Svinovodstvo, Selskokhoviaislvennyi, Nauk-Bibliotek, Moscow, U.S.S.R.

"The New Protein Utilization of Fish Meals Manufactured in Chile for Human and Animal Consumption," by G. Donoso and E. Yanez, article, News Summary, International Association of Fish Meal Manufacturers, no. 10, 1962, pp. 66-76, printed in English with French, German, and Spanish summaries. (Translated from the Spanish, Nutricion, Bromatologia, Toxicologia, Chile, vol. 1, no. 2, 1962, pp. 97-105.) International Association of Fish Meal Manufacturers, 70 Wigmore St., London W1, England.

"Nutritional Evaluation of Fish Meals Using Four Short-Term Chick Tests," by L. E. Ousterhout and D. G. Snyder, article, Poultry Science, vol. 41, 1962, pp. 1753-1757, printed. Poultry Science Association, Ohio State University, Columbus 10, Ohio.

"Protein Quality of Different Types of Herring-Meal in Balance Experiments With Growing Pigs," by T. Homb, article, Meldinger fra Norges Landbrukshogskole, vol. 41, no. 5, 1962, p. 31, printed in Norwegian with English Summary. Meldinger fra SSF, Bergen, Norway.

FISH OILS:

"Epoxidation of Some Marine Animal Oils and Properties of the Epoxides as Plasticizers," by S. Komori and others, article, Journal, Chemical Society of Japan, vol. 64, 1961, pp. 1203-1208, printed. Suru, Gadai-Kauda Chiyoda-Ku 5, 1-Chome, Tokyo, Japan.

FISH POPULATIONS:

Role of Youth in Creating Abundance of Fish, USSR, by A. Isayev, OTS 63-31507, 6 pp., printed, 50 cents, August 12, 1963. Office of Technical Services, U.S. Department of Commerce, Washington, D. C., 20235.

FISH PROTEIN CONCENTRATE:

"Effect of Supplementing Sorghum and Groundnut Diets with Fish Flour or Pure Amino Acids," by J. Adrian, R. Jacquot and M. Forestier, article, Annales de la Nutrition et de l'Alimentation, vol. 15, 1961, pp. 227-237, printed in French. Centre National de la Recherche Scientifique, 13 quai Anatole-France, Paris VII, France.

A Report to the Fishing Industry on an Improved Method of Producing Fish Protein Concentrate, by H. E. Power, New Series Circular No. 10, 2 pp., processed, September 21, 1962. Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

FISH SAUSAGE:

"Produksjonen av Fiskepolser in Japan" (Production of Fish Sausages in Japan), article, Tidsskrift for Hermetikindustri, vol. 49, no. 12, December 1963, pp. 489-492, illus., printed in Norwegian. Norske Hermetikfabrikers Landsforening, Stavanger, Norway.

FISH SILAGE:

"Fish Silage as a Protein Feed for Fattening Pigs," by L. V. Braunschweig and H. Gorlitz, article, Deutsche Landwirtschaft, vol. 12, 1961, pp. 461-462, printed in German. Deutscher Bauernverlag, Reinhard-str. 14, Berlin NW7, Germany.

"Fish Silage--A Valuable Animal Protein Feed," by G. Schellner, H. Trautmann, and G. Linke, article, Jahresbericht Arbeitgemeinschaft Futterungsberatung, vol. 3, 1960/61, pp. 202-209, printed in German. Futterungsberatungsstelle, Dresden A 1, Germany.

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FOOD AND AGRICULTURE ORGANIZATION:

World Food Congress, Technical Commission, Agenda Item: I.C.2, by F. O. Otorubio, Commission Paper: WFC/63/CP/I.C./2b, 9 pp., printed. Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

The Food and Agriculture Organization has published reports describing that Agency's activities under the Expanded Program for Technical Assistance for developing the fisheries of many countries. These reports have been processed only for limited distribution to governments, libraries, and universities. Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

Informe al Govierno del Ecuador sobre la Biologia del Camaron (Report to the Government of Ecuador on the Biology of the Shrimp), by Robert W. Ellis, FAO Report No. 1537, 51 pp., illus., processed in Spanish, 1962.

Informe al Gobierno de Cuba sobre la Encuesta Acerca de las Pesquerias (Report to the Government of Cuba on Costs in Relation to the Fisheries), by George C. Salmon, FAO Report No. 1597, 100 pp., 1963.

Report to the Government of Nigeria on Improvements in the Bulk Smoking of Bonga in Western Nigeria, by Mieczyslaw Piatek, FAO Report No. 1756, 68 pp., 1963.

FOOD PROCESSING:

Food Processing Operations--Their Management, Machines, Materials, and Methods, by J. L. Heid and Maynard A. Joslyn, vol. 2, 605 pp., illus., printed, 1963, domestic $19.75, foreign $20.75. The Avi Publishing Co., Inc., P. O. Box 388, Westport, Conn. This is the second volume of a series of books which summarizes the numerous factors involved in successful food-processing operations--from the source of the raw material to the sales outlet. Whereas volume 1 covers management techniques, raw materials, facilities, and utilities, volume 2 contains comprehensive summaries by specialists of their ideas, their know-how, and their skills on processing, packaging, and legal regulations. The information is written in such a manner as to be of maximum use to any plant processing food products. Volume 2 contains 17 chapters. One chapter deals entirely with Federal and state regulation of processed foods. There are chapters on cattle, hogs, and sheep; poultry production and processing; fats and oils; use of acids in food processing; seasoning for the food manufacturer; vitamins as ingredients in food processing; preservatives and antioxidants; enzymes in food processing; metal containers for food; glass containers; flexible packaging in food processing; corrugated and solid fiber boxes; food processing by heat sterilization; processing by fermentation; and food processing by drying and dehydration. With food processing becoming more complex, this type of book will aid considerably in guiding management through some of the many complexities that have developed. With reference to fish processing, there is information on acids in frozen fish, oils for fish canning, and acids in shellfish. Each chapter contains a selected and adequate bibliography. The book has a very good index. Processors and others interested in food products will find much that will be of value and interest in both volumes 1 and 2. (Also see Commercial Fisheries Review, August 1963, p. 135, for review of volume 1.)

--Joseph Pileggi

FRANCE:

"Les Ports du Nord Vont se Grouper en un Comite Regional des Peches Maritimes" (The Northern Ports Want to Group Themselves into a Regional Committee of Marine Fisheries), article, France Peche, no. 80, January 1964, pp. 41-42, printed in French. France Peche, Boite Postale 179, Lorient, France.

FREEZING:

Freezing of Fish in Vertical Plate Freezers--Effect of Loading Procedure, by J. H. Merritt, Torry Memoir No. 150, 7 pp., printed, 1963. (Reprinted from World Fishing, September 1963.) Torry Research Station, Aberdeen, Scotland.

Freezing Meat and Fish in the Home, Home and Garden Bulletin No. 93, 23 pp., illus., printed, 20 cents, December 1963. Animal Husbandry Research Division and Human Nutrition Research Division, Agricultural Research Service, U. S. Department of Agriculture, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) As an excellent method of preserving meat and fish, freezing can be done simply and effectively at home if the products are carefully selected, prepared, and packaged; and home freezing equipment freezes quickly at 0° F. or lower, and maintains those temperatures for storage of frozen products. This booklet explains general freezing procedures; cutting and boning methods for meat; meat yields; fish selection, and cleaning and dressing; wrapping, freezing, and storing; storage periods; and thawing meats and fish.

"Immersion Freezing," by R. C. Webster and E. J. Benson, article, Food in Canada, vol. 22, no. 11, 1962, pp. 27-30, 33, printed. Maclean-Hunter Publishing Co. Ltd., 481 University Ave., Toronto 2, Canada.

FROZEN FISH:

"On the Deterioration of Frozen Fish during Storage," by J. Nishimoto, article, Memoirs of the Faculty of Fisheries, Kagoshima University, vol. 11, no. 1, 1962, pp. 41-64, illus., printed in Japanese with English summary. Faculty of Fisheries, Kagoshima University, Shimoarata-Machi, Kagoshima, Japan.

FROZEN FOODS:

Consumer Practices in the Handling and Storing of Commercially Frozen Foods, Two Cities, Two Seasons, by Ruth A. Restrom, Elizabeth Davenport, and Janet Murray, Home Economics Research Report No. 23, 29 pp., illus., printed, 20 cents, September 1963. Agricultural Research Service, U. S. Department of Agriculture, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) The research reported in this publication was undertaken to find out how frozen foods are handled and stored in the home in order to ascertain to what extent these practices might affect the quality of the food. In order to obtain data for practical use in

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educational and marketing programs, surveys of approximately 300 households were made in each of 2 cities at 2 seasons of the year. Homemakers in representative samples of families in Baltimore, Md., were interviewed in the summer of 1959 and the winter of 1960, and in Indianapolis, Ind., in the summer of 1960 and the winter of 1961. In both Baltimore and Indianapolis, data on the purchase and use of 3 groups of frozen foods--fruits, juices, and vegetables--were obtained for the 7-day period before the interview. In Indianapolis, the survey was broadened by the addition of 2 other types of frozen foods--baked goods and a meat group comprising meat, poultry, and fish or seafood--frozen plain, breaded, or with sauces--and meat dinners. From data gathered and evaluated in this study, it would appear that, in the great majority of cases, household practices alone would not be a determining factor in serious quality deterioration of frozen foods.

FUR SEALS:

Report on Canadian Pelagic Fur Seal Research in 1963, by G. C. Pike, Manuscript Report Series (Biological) No. 761, 29 pp., printed, 1963. Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada.

GENERAL:

Weltfischwirtschaft (World Fisheries), by Wolfgang Krone, 134 pp., illus., printed 1963, DM 32 (about US$8). Westliche Berliner Verlagsgesellschaft Heenemann KG, 102 Uhlandstrasse, Berlin 31, Germany. This book is based on the author's doctoral thesis, titled "The Fishing Industries' Contribution to Human Nutrition," and deals with the contribution fisheries can make to the Freedom from Hunger Campaign, and the future development prospects of the fishing industry on a world-wide scale. Emphasis is placed on the economic implications of fisheries development; however, both biological and technical aspects influencing fisheries are seen in close connection with the economic ones. To study the interrelation between biological, technical, and economic factors is, in fact, one of the main objects of the book. The author pleads for a more intimate collaboration among biologists, technicians, and economists in fisheries, which would certainly facilitate the solution of many problems in world fisheries. After surveying the basic biological and natural conditions of fisheries, the author discusses in a very interesting way the economic problems involved in optimum utilization of fishery resources of the sea. In view of the threat of overfishing in some areas and the ensuing regulatory measures, these problems deserve increasing attention. The author stresses that increasing care should be taken of the natural fish stock; regulatory measures should, however, take economic effects into account, and possible means of achieving those aims are described. A detailed survey of fish production, international trade and the fisheries' contribution to national income, export proceeds and human nutrition showing the economic importance of the fishing industry in different countries ends the first half of the book. The second half deals with the possibilities of achieving an increased world fish production and consumption. The author, who is optimistic as regards the biological and technical aspects of increasing fish production in developing countries, examines the favorable effects of fisheries projects on national income, employment, balance of payments, and other sectors of the economy, to prove that fisheries could make an important contribution to over-all economic progress in those countries. The practical problems encountered at any stage from the producer of fish to the retailer, and the possible ways and means of solving them, are dealt with in the conclusion of the book. The author has selected adequate statistics for his study. The book would be interesting and stimulating to people engaged, not only in fisheries, but in economics and development policies in general.

--A. Holm, Fisheries Division, O.E.C.D.

GERMAN FEDERAL REPUBLIC:

Jahresbericht uber die Deutsche Fischwirtschaft, 1962/63 (Annual Report on German Fisheries, 1962/63), issued by the Federal Ministry of Food, Agriculture and Forestry in cooperation with the Federal Statistical Office, 296 pp., illus., printed in German with English table of contents and summaries, October 1963. (Available from Gebr. Mann, Hauptstrasse 26, Berlin 62, Germany.) A review covering all phases of the German fisheries in 1961/62. Part I contains information on fishery policy, legislation, the sea and coastal fisheries as well as the fish supply, the German fishing fleet, biological-statistical report on the German deep-sea fishery, and foreign trade in fishery products. Part II includes information on cruises on the fishery protection and fishery research vessels, the fishing industry and the Seamen's Vocational Association, work of the German Scientific Commission for the Exploration of the Sea, fishery research, and technical assistance program of the Federal Republic of Germany for foreign fisheries. Part III presents data on the cutter deep sea and coastal fisheries, fresh-water fisheries, and the fish meal and oil industry. Part IV gives data on foreign fisheries and whaling.

INDIA:

8th Annual Report, 1962-63, Gujarat Fisheries Central Co-Operative Association Ltd., Ahmedabad-9 India, 50 pp., illus., printed. Gujarat Fisheries Central Co-Operative Association Ltd., Ahmedabad 9, India.

INTERNATIONAL COMMISSIONS:

Annual Report for the Year 1962, 149 pp., printed, 1963. The Inter-American Tropical Tuna Commission, La Jolla, Calif.

International Commission for the Northwest Atlantic Fisheries, Annual Proceedings for the Year 1962-63, vol. 13, 46 pp., printed, 1963. International Commission for the Northwest Atlantic Fisheries, Bedford Institute of Oceanography, Dartmouth, N.S., Canada. Presents an account of the activities of the Commission's Secretariat during the year ending June 30, 1963, including financial statements; a report of the Thirteenth Annual Meeting held June 3-7, 1963, in Halifax, N.S., Canada; and summaries of research during 1962 by Subareas.

IRRADIATION PRESERVATION:

Food Preservation by Irradiation, no. SB. 403, 11 pp., processed, 1962, Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Irradiation Nears Reality," by Joseph W. Slavin and P. Miller, article, Food Engineering, January 1964, pp. 92, 94, 98, illus., printed. Chilton Co., Chestnut and 56th St., Philadelphia 39, Pa. Commercial use of ionizing radiation for the preservation of fishery products was brought one step closer to reality with the recent start of construction of a Marine Products Development Irradiator in Gloucester, Mass. Radiation pasteurization offers promise as a means of extending the shelf life of fresh seafood. Investigations are being conducted on groundfish fillets and soft-shell clam meats at the Massachusetts Institute of Technology and the Bureau of Commercial Fisheries Technological Laboratory in Gloucester. The Atomic Energy Commission is sponsoring research on other fishery products. The Gloucester laboratory is now studying the effects of pasteurizing doses of radiation on the quality of ocean perch and cod and on the volatile compounds that comprise the flavor and odor of seafood. They are also looking into new methods of packaging irradiated products. The new irradiator at Gloucester will be used to obtain information on the commercial feasibility and cost of processing and distributing irradiated seafoods.

JAPAN:

Memoirs of the Faculty of Fisheries, Kagoshima University, vol. 12, no. 1, October 1963, 76 pp., illus., printed in Japanese with English summaries. The Faculty of Fisheries, Kagoshima University, Kagoshima, Japan. Includes, among others, these articles: "Changes of the Oil Contained in Dried Fish Muscle. I--The Effect of Packaging on the Changes of Oil," by Shigenobu Oyama; "Preventive Effect of Polyphosphate on the Drip-Formation of the Thawed Fish Flesh," by Fuyuo Ohta and Jun-ichi Nishimoto; "Studies on the Fishing Gear and the Fishing Efficiency of the Two-Boat Trawl Fishery (Preliminary Report). Some Problems on Construction of the Net Made of Manila Twine," by Nobio Higo; "The Culture of Uni-Cellular Red Algae, Porphyridium cruentum," by Koji Nozawa; and "Studies on Some Marine Algae from Southern Japan. IV," by Takesi Tanaka.

Present Status and Problems in the Water Policy for Fisheries, by Motokichi Morisawa, 42 pp., illus., printed in Japanese. Japan Fisheries Resources Association, Shiba Nishikubo Sakuragawa-cho 24, Tokyo, Japan.

Statistical Data on Frozen Fishery Products, Fiscal Year 1962, 20 pp., processed in Japanese. Japan Frozen Food Exporters' Association, Tokyo, Japan. Presents statistical tables showing data on frozen food exports in 1962; frozen tuna export validations: (1) by country of destination (January-December 1962 and for fiscal year April 1962-March 1963) and prices, (2) to United States from domestic port and by area of transshipment; and frozen tuna exports and prices to Canada, Italy, Yugoslavia, and other countries. Also contains data on frozen broadbill swordfish export validations and prices to United States; miscellaneous frozen fish and shellfish exports to United States; and miscellaneous frozen fish and shellfish exports to other countries (except United States).

"Symposium on the Bottom Trawl Fisheries in the East China and Yellow Seas," article, Nihon Suisan Gakkai-shi, vol. 29, no. 6, June 1963, pp. 546-629, printed in Japanese. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

KOREA:

1963 Agricultural Year Book, 613 pp., illus., printed in Korean and English. The National Agricultural Co-Operatives Federation, Seoul, Korea. Includes a section of statistical tables showing data on numbers of fishing vessels, marine products, fishery population, holdings of fishing boats by district, products of aquatic culture, and processed marine products. Also includes data on imports and exports of fishery products.

LAKE TROUT:

Save the Lake Trout?, Fish Division Pamphlet No. 33, 4 pp., processed, March 1961. Fish Division, Michigan Department of Conservation, Lansing 26, Mich.

MACKEREL:

"Changes of Amino Acid Contents during Fermentation of Mackerel Muscle. 1--Examination of Assay Method for Free Amino Acids in Fresh and Fermented Muscle. 2--Amino Acid Contents of Autolysed and Fermented Ordinary Muscle of Mackerel," by N. Hoshino, article, Shokuryo Kenkyujo Kenkyu Hokoku, vol. 16, February 1962, pp. 39-46, printed in Japanese with English abstract. Food Research Institute, Fukagawa Kenkyujo, Hama Zono Cho, Koto-Ku, Tokyo, Japan.

MARINE BIOLOGY:

Books on Aquatic Biology; Fresh-Water and Marine; Prepared for the Biological Sciences Communications Project, by Carl R. Keeler, 45 pp., printed, 1963. George Washington University, Washington D. C.

MARINE MAMMALS:

"Conservation Practices for Marine Mammals," article, Trade News, vol. 16, no. 7, January 1964, pp. 9-10, illus., processed. Information and Consumer Service, Department of Fisheries, Ottawa, Canada.

Marine Mammal Investigations, by John J. Burns and and Loren W. Croxton, 39 pp., illus., processed, June 1963. Alaska Department of Fish and Game, Juneau, Alaska.

MEGRIM:

The Food of the Megrim, by Bennet B. Rae, Marine Research 1963 No. 3, 23 pp., printed. Department of Agriculture and Fisheries for Scotland, Aberdeen, Scotland.

MULLET:

Synopsis of Biological Data on the Grey Mullet (MUGIL CEPHALUS Linnaeus) 1758, by J. M. Thomson, Fisheries Synopsis No. 1, 1 vol., printed, 1963. Commonwealth Scientific and Industrial Research Organization, 314 Albert St., E. Melbourne C2, Australia.

NATURAL RESOURCES:

Natural Resources and International Development, edited by Marion Clawson, 473 pp., printed, 1964, $7.50. The Johns Hopkins Press, Baltimore, Md., 21218. The relationship between natural resources

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and economic growth in broad regions of the world; the interdependence between resources and the techniques, policies, and institutions that control their usability; and the contribution that wise resource management can make to the economic growth of a nation is what this book is about. Samplings of some of the best thought on the conservation, development, and use of natural resources as they relate to economic growth on a world scale are presented in ten essays (presented at the 1963 Forum of Resources for the Future, Inc.). Of particular interest to members of and all those interested in the fishery industries is the essay on "Food and the World Fisheries Situation," by Anthony D. Scott, Department of Economics and Political Science, University of British Columbia. In the very first sentence the author points out: "The contribution that fisheries development can make to international economic development is probably small compared with that to be expected from agriculture and mining. But the word 'probably' is important, for the rational exploitation of the seas is still in its infancy." In the second paragraph the author makes the further qualification: "We are just beginning to assess the seas' full potential productivity." Then the author goes on to point out that when better developed the seas will be an important source of food, and that this resource can be relied upon to expand and continue. The essay is concerned with this aspect of international economic development. Covered in the essay are the growth of demand; supply from the standpoint of indicated productivity of the ocean and potential productivity (discusses fishing gear and equipment); and increasing the productivity of the oceans. The essay concludes with a discussion of the biology and economics of overfishing and patterns of international cooperation. Of the ten essays in the book, three are on commodities--fisheries, agriculture, and oil; four focus on resource problems in regions of the world (Western Europe, the Soviet Union, Africa, and Latin America); and the final three concern the potentialities and hazards of foreign investment for resource development, the terms of trade between raw material exporting and importing countries, and the transfer of knowledge and capital across national boundaries. The book is adequately indexed. Considering the interest in conservation today, this is a timely and thought-provoking book.

--Joseph Pileggi

NORTHEAST ATLANTIC:

North-East Atlantic Fisheries Convention, London, January 24, 1959 (The United Kingdom instrument of ratification was deposited on August 27, 1959, and the Convention entered into force on June 27, 1963), Treaty Series No. 68, printed, 30 cents, 1963. British Information Services, 845 3rd Ave., New York 22, N. Y.

NORTHWEST ATLANTIC FISHERIES:

Northwest Atlantic Fisheries, Declaration of Understanding between United States and Other Governments Regarding Convention of February 8, 1949, Signed Washington April 24, 1961, 7 pp., printed, 5 cents, 1963. U. S. Department of State, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.)

OCEANOGRAPHY:

Data from the First Plenum of the Section on Underwater Research, Oceanographic Commission, OTS 63-31934, 77 pp., printed, $2, October 14, 1963. (Translated from the Russian, Okeanograficheskaya Komissiya, Trudy, vol. 14, 1962, pp. 5-6, 76-107, 116-130.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

Journal du Conseil, vol. XXVIII, no.2, September 1963, 156 pp., illus., printed in French and English, single copy Kr. 16 (about US$2.30.) Andr. Fred. Host & Son, Bredgade, Copenhagen, Denmark. Includes, among others, articles on: "The Food of the Irish Sea Herring in 1961 and 1962," by A. L. Rice; "Incidence of Coccidioses in Scottish Herring," by Z. Kabata; "The Influence of Egg Size on Herring Larvae (Clupea harengus L.)," by J. H. S. Blaxter and G. Hempel; "On the Relative Fishing Power of Dutch Trawlers," by J. J. Zijlstra and J. F. deVeen; "Marine Fish Culture in Britain. IV--High Survivals of Metamorphosed Plaice during Salinity Experiments in Open Circulation at Port Erin, Isle of Man, 1961," by J. E. Shelbourne; "Marine Fish Culture in Britain. V--An Electronic Device for Counting the Nauplii of Artemia salina L.," by R. B. Mitson; "Preliminary Observations on the Relationship between Growth, Spawning and Condition in Experimental Colonies of Venus mercenaria L.," by A. D. Ansell and F. A. Loosmore; and "Studies on the Age and Growth, Fecundity and Spawning of Osteogeneiousus militaris (Linn.)," by V. Rayappa Pantulu.

Oceanographical Observations in the Indian Ocean in 1961, H.M.A.S. DIAMANTINA (Cruise Dm 2/61), Oceanographical Cruise Report No. 9, 172 pp., illus., processed, 1963. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia.

Oceanographical Observations in the Pacific Ocean in the Pacific Ocean in 1961, H.M.A.S. GASCOYNE (Cruise G 1/61), Oceanographical Cruise Report No. 8, 147 pp., illus., processed, 1963. Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization, Melbourne, Australia.

"Oceanography," article, Current Affairs Bulletin, vol. 32, no. 13, November 11, 1963, pp. 195-208, illus., printed, single copy 6d. (about 10 U. S. cents). Current Affairs Bulletin, The University of Sydney, Sydney, Australia.

OCEAN PERCH:

"Identity of Larval Redfish Populations in the North Atlantic," by G.T.D. Henderson, article, Nature, vol. 201, no. 4917, January 25, 1964, p. 419, illus., printed. St. Martin's Press, Inc., 175 Fifth Ave., New York 10, N. Y.

OCTOPUS:

"Notes on the Laboratory Culture of the Octopus Larvae," by K. Itami and others, article, Nihon Suisan Gakkai-shi, vol. 29, no. 6, June 1963, pp. 514-520, printed in Japanese with English abstract. Japanese Society of Scientific Fisheries, Shiba-Kaigandori 6, Minato-ku, Tokyo, Japan.

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OREGON:

Biennial Report, July 1, 1960-June 30, 1962, to the Governor and the Fifty-Second Legislative Assembly, 34 pp., illus., printed, limited distribution. Fish Commission of Oregon, 307 State Office Bldg., 1400 SW. 5th Ave., Portland 1, Oreg. Discusses the accomplishments of the Oregon Fish Commission's Research Division, including albacore investigations, otter trawl investigations, hatchery biology investigations, Columbia River Fishery Development Program, coastal rivers investigations, mark analysis investigation, fish passage research, troll salmon investigations, and shellfish investigations. Also discusses the Commission's work in fish culture, engineering, development of water resources, and information and education. Includes statistical tables showing data on liberations of salmon into Oregon streams, egg taking at hatcheries, licenses issued, fish landings, and law enforcement.

History of the Oregon Trawl Fishery, 1884-1961, by George Y. Harry, Jr. and Alfred R. Morgan, 22 pp., illus., printed. (Reprinted from Research Briefs, Fish Commission of Oregon, vol. 9, no. 1, May 1963, pp. 5-26.) Fish Commission of Oregon, 307 State Office Bldg., 1400 SW. 5th Ave., Portland 1, Oreg. Early records show that between 1884 and World War II several attempts were made to start a trawl fishery but it did not flourish until the war created a demand for bottomfish. Since the war the Oregon fishery has been maintained at various levels of production. Many gear improvements have been introduced. The average size of fishing vessels has increased and larger engines, heavier otter doors, and drums with greater cable capacity have been installed. More instrumentation has been added to aid the trawl fisherman. Some boats have abandoned ice for refrigeration in favor of chilled sea water in tanks. Trawlers have tended to move farther from their home ports although fishing trips are still only about 3 to 5 days. The time per tow has increased in recent years to 3 or 4 hours on some grounds. Fish landings have fluctuated in response to market conditions. The peak trawl fishery in numbers of boats and pounds landed occurred during World War II, followed by a severe decline in landings in the early 1950's and slow recovery in the late 1950's.

OYSTERS:

"Historical Notes on the Oyster Fisheries of Ireland," by Arthur E. J. Went, article, Proceedings of the Royal Irish Academy, vol. 62, sec. C, no. 7, August 1962, pp. 195-223, illus., printed, 3s. (about 45 U.S. cents). Hodges, Figgis and Co., Ltd., 6 Dawson St., Dublin, Ireland.

Studies on Oysters in Relation to the Oil Industry, by J. G. Mackin and S. H. Hopkins, 319 pp., printed, 1962. Institute of Marine Science, Port Aransas, Tex.

PACIFIC OCEAN:

The Principal Hydrological Features of the Pacific Ocean, by A. M. Muromtsev, OTS 63-11065, 421 pp., illus., processed, 1963. (Translated from the Russian, Osnovnye Cherty Gidrologii Tikhogo Okeana.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C. 20235.

PACKAGING:

"Recent Experiments with the Packaging of Unfrozen and Smoked Fish," by J. M. Shewan and G. Hobbs, article, Fishing News, no. 2585, 1963, pp. 7, 12, printed. A. J. Heighway Publications Ltd., 110 Fleet Street, London EC4, England.

PARASITES:

The Incidence of Larvae of PORROCAECUM DECIPIENS in the Flesh of Cod, by Bennet B. Rae, Marine Research 1963 No. 2, 28 pp., printed. Department of Agriculture and Fisheries for Scotland, Aberdeen, Scotland.

PEARL CULTURE:

"Growing Pearl Oysters in Tanks," by Edith Landau, article, New Scientist, vol. 20, no. 368, December 5, 1963, pp. 618-619, illus., printed, single copy 1s. (about 15 U.S. cents). Cromwell House, Fulwood Pl., High Holborn, London WC1, England. The cultivation of pearl oysters in water tanks, conducted in 1963 in the National Pearl Research Laboratory at Kashikojima, Japan, opens the possibility of liberating pearl cultivation from such hazards as typhoons and tidal waves. Pearl oysters (Pinctada martensii Dunker) grew in 6 culture tanks of aerated sea water and were fed daily on a diet of diatoms. Researchers believe that the promising results ot their trials warrant a more comprehensive project aimed at improving culture equipment and the feeding mechanics, as well as comparing growth rates achieved with different nutrients.

PERU:

Peruvian Fisheries Number - 1963 - of the Peruvian Times, October 28, 1963, 59 pp., illus., printed, s/. 25.00 (about 93 U. S. cents). Peruvian Times, S. A., Jiron Carabaya 928, Office 304, P. O. Box 531, Lima, Peru. A special annual issue devoted to the fisheries of Peru and containing articles on the expansion of the Peruvian fisheries industry; 1962 exports of fishery products; anchovy fishery off Peru; IV Annual Conference of the International Association of Fish Meal Manufacturers, held at Lima, October 28-31, 1963; declaration of Peru of 200-mile territorial waters; regulation of fishing permits for foreign vessels; statistical tables giving data on landings and exports of fishery products, 1957-1962; directory of the National Fisheries Association; and and fishing vessels at Callao. Also presents information on fish-meal reduction plants, a trip in a purse seiner, malnutrition in Peru, a visit to the fishing villages of Sechura Bay, aerial fish-spotting, land-based whaling station near Paita, activities of the Peruvian Fisheries Service, the Marine Resources Research Institute, the origin of trout hatcheries in Peru, and the Cabo Blanco big game fishing.

"La Pesca in Peru--Como se Desarrollo una Gran Industria Nacional" (Peruvian Fishing Industry--How a Great National Industry was Developed), by Roberto Lecca Pardo, article, Puntal, vol. X, no. 116, November 1963, pp. 4-7, illus., printed in Spanish. Puntal, Apartado de Correos 316, Alicante, Spain.

PHYSIOLOGY:

"A New Apparatus for Measuring the Course of Rigor Mortis in Fish and Mammalian Muscles," by G. N. Karlsruhe, article, Fleischwirtschaft, vol. 15, no. 1,

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1963, pp. 21-23, illus., printed in German with English, French, Italian and Spanish summaries. Verlagshaus Sponholz, 14/16 Neue Mainzerstrasse, Frankfurt a/M, Germany.

PLANKTON:

The Net Phytoplankton Taken in Virginia Tidal Waters January-December 1962, by Richard A. Mulford, Special Scientific Report No. 43, 22 pp., illus., printed, 1963. Institute of Marine Science, Gloucester Point, Va.

POND FISHERIES:

Hydrobiological Studies on the Artificially Constructed Ponds ("Tameike" Ponds) of Japan, by Toshihiko Mizuno, 125 pp., printed, 1961. (Reprinted from Japanese Journal of Limnology, vol. 22, 1961.) Otsu Hydrobiological Station, Kyoto, Japan.

PORPOISES:

"Iz Opyta Promyslovogo Lova Del'finov" (On the Experience Gained in Commercial Fishing for Porpoises), by A. I. Petrenko, article, Rybnoe Khoziaistvo, vol. 38, no. 3, 1962, pp. 44-48, illus., printed in Russian. VNIRO Glavniproekta, pri Gosplanie SSSR, Moscow, U.S.S.R.

PORTUGAL:

"Artes de Pesca na Area Maritima do Sul" (The Art of Fishing in the Maritime Area of the South), by Jorge Teles de Faria Correia Bastos, article, Boletim da Pesca, vol. XV, no. 81, December 1963, pp. 11-69, illus., printed in Portuguese. Gabinete de Estudos das Pescas, R. S. Bento, 644, 4º Esq., Lisbon, Portugal.

"La Pesca en Portugal en 1962 y la Industrial Conservera" (The Fishery in Portugal in 1962 and the Canning Industry), article, Boletim de Informacion del Sindicato Nacional de la Pesca, nos. 62-63, November-December 1963, pp. 10-11 printed in Spanish. Sindicato Nacional de la Pesca, Paseo del Prado, 18-20, 6ª Planta, Madrid, Spain.

SALMON:

Annual Fish Passage Report, North Pacific Division, Bonneville, The Dalles, McNary and Ice Harbor Dams, Columbia and Snake Rivers, Oregon and Washington, 1962, 73 pp., illus., processed, 1963. U. S. Army Engineer District, Portland, Oreg.

Annual Report, 1962, 55 pp., printed, 1963. Skeena Salmon Management Committee, Fisheries Research Board of Canada, Biological Station, Nanaimo, B. C., Canada.

"Barge Block to Save Salmon," article, Outdoor California, vol. 25, no. 2, February 1964, pp. 3-6, illus., printed. Documents Section, Printing Division, P. O. Box 1612, Sacramento, Calif., 95807. Describes the partial blocking of the San Joaquin River with a 130-foot barge loaded with 600 tons of sand to aid in breaking up pollution blocks. Also discusses the accomplishments of the California Department of Fish and Game in salmon conservation in the California Central Valley.

On the Biology of Primorsky Pink Salmon, ONCORHYNCHUS GORBUSCHA (Walbaum), by O. V. Vasilenko-Lukina, Circular 197, 8 pp., illus., processed, July 1963. (Translated from the Russian, Voprosy Ikhtiologii, vol. 2, no. 4, 1962, pp. 604-608.) Fisheries Research Institute, College of Fisheries, University of Washington, Seattle 5, Wash.

Data Report, Salmon Tagging Experiments in Prince William Sound 1960-1961, by Wallace Noerenberg and David G. Savoie, Informational Leaflet 28, 38 pp., illus., processed, December 1963. Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska.

New Data on the Migration of Pink Salmon in the Sakhalin Area, by P. A. Dvinin, OTS 63-11103, 4 pp., illus., processed, 1963. (Translated from the Russian, Rybnoe Khoziaistvo, vol. 34, no. 1, 1958, pp. 12-15.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

"Questions and Answers about Atlantic Salmon," by Paul F. Elson, article, The Atlantic Salmon Journal, no. 3, December 1963, pp. 8-9, illus., printed. The Atlantic Salmon Association, 1559 McGregor St., Montreal 25, Canada.

"Restoration of a North Shore Salmon River," by C. R. Smith, article, The Atlantic Salmon Journal, no. 3, December 1963, pp. 3-7, illus., printed. The Atlantic Salmon Association, 1559 McGregor St., Montreal 25, Canada. Discusses salmon stock rehabilitation in the Great Watchichou River, in the Province of Quebec about 500 miles northeast of Quebec City and 175 miles from Seven Islands.

"The Salmon Fishery in the U.S.S.R.," by Boris Tarasyuk, article, The Atlantic Salmon Journal, no. 3, December 1963, pp. 18-20, illus., printed. The Atlantic Salmon Association, 1559 McGregor St., Montreal 25, Canada. Discusses measures taken in the Soviet Far East to protect spawning salmon; field stations concerned with salmon escapement and other research work in Kamchatka, Sakhalin, the Amur region, the Okhotsk coast, and the Maritime region; and salmon river improvement. Also covers the reduced salmon escapement in many rivers; artificial spawning of salmon in hatcheries; artificial feeding of salmon fingerlings; and the need of regulation of commercial fishing in order to provide sufficient escapement to allow the improvement of Pacific salmon stocks.

Salmon of the North Pacific Ocean. Part II--Review of Oceanography of the Subarctic Pacific Region, by A. J. Dodimead, F. Favorite, and T. Hirano, Bulletin No. 13, 198 pp., illus., printed, 1963. International North Pacific Fisheries Commission, 6640 NW. Marine Dr., Vancouver 8, B. C., Canada.

SALT FISH:

Review of Salted Fish Production and the European Markets, 1962-63 Season, 44 pp., printed, 1963. Hawes and Company Ltd., London, England.

SARDINE:

Synopsis on the Biology of the Sardine (SARDINELLA AURITA Valenciennes) (African Atlantic), by E. Postel, FAO Fisheries Biology Synopsis No. 6, 49 pp., illus., processed in French, distribution restricted, 1960. Biology Branch, Fisheries Division, Food and Agriculture Organization of the United Nations, Viale delle Terme di Caracalla, Rome, Italy.

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SCALLOPS:

Report of Scallop Bed Reconnaissance Work Carried Out by the Scallop Dragger OCEAN SWELL, by George Imbeault, 6 pp., illus., printed, 1963. Canadian Department of Fisheries, Ottawa, Canada.

SCARIDAE:

"On the Fishes of the Family Scaridae of Japan, Including the Riu Kiu Islands," by T. Kamohara, article, Reports of the Usa Marine Biological Station, vol. 10, no. 1, June 1963, pp. 1-24, printed. Usa Marine Biological Station, Oita Prefecture, Usa, Japan.

SEALS:

"The Hawaiian Monk Seal," by Dale W. Rice, article, Natural History, vol. LXXIII, no. 2, February 1964, pp. 48-55, illus., printed, single copy 50 cents. The American Museum of Natural History, Central Park W. at 79th St., New York, N.Y., 10024.

Protocol to Extend the Provisions of the International Convention for the Northwest Atlantic Fisheries Signed at Washington on February 8, 1949, to Harp and Hood Seals, Washington, July 15, 1963 (The Protocol has not been ratified by the United Kingdom), Miscellaneous No. 18, printed, 20 cents, 1963. British Information Services, 845 3rd Ave., New York 22, N. Y.

SHAD:

Surface Trawl Surveys to Determine the Abundance of Juvenile American Shad (ALOSA SAPIDISSIMA) in the Pamunkey and Mattaponi Rivers, 1952-1956, by W. H. Massmann, Special Scientific Report No. 46, 8 pp., printed, 1963. Institute of Marine Science, Gloucester Point, Va.

SHARKS:

Distribution of Sharks in the Canadian Atlantic (with Special Reference to Newfoundland Waters), by Wilfred Templemen, Bulletin No. 140, 77 pp., printed, 1963. Fisheries Research Board of Canada, Sir Charles Tupper Bldg., Riverside Dr., Ottawa, Canada.

The Dogfish Shark, a Photographic Study, by Addison E. Lee and others, 38 pp., illus., printed, 1963. Holt, Rinehart, and Winston, Inc., 383 Madison Avenue, New York, N. Y. 10017. The purpose of this atlas is twofold. It can serve as an adjunct to a laboratory manual and thus be of aid to students in locating structures which otherwise might be difficult to find, and in correctly identifying the structures of the dogfish shark. In addition, the atlas can be used as a study guide both to familiarize the student with the structures before dissection, and to review them afterward. The authors believe that photographs are superior to drawings for use by beginning students, since photographs are more realistic and demonstrate precisely the actual relationships among the anatomical structures. The atlas has been arranged according to systems, since this arrangement is the one adopted in a large number of comparative anatomy courses. Because the dogfish is used to introduce the student to fundamental structures of vertebrates, those structures have been photographed which the authors feel are most valuable for a competent understanding of basic anatomy. The atlas covers the external anatomy, digestive system, mesenteries, female urogenital system, male urogenital system, circulatory system, heart and associated vessels, notochord and associated structures, eye, inner ear, and brain.

SMALL BUSINESS MANAGEMENT:

Helping Small Firms Develop and Exploit New Products, by Delmar W. Karger and Andrew B. Jack, Management Research Summary, 4 pp., illus., processed, 1963. Small Business Administration, Washington, D. C. 20416. Results of this study show that small manufacturers can be helped by a program of conferences on basic management followed by individual counseling. Firms taking part in the study had a 15-percent increase in sales during the 18-month project. Sales of a control group dropped 8 percent during the same period.

Profits and Competition in Retail Food Pricing, by Lee E. Preston, Reed Hertford, and Jim D. Likens, Management Research Summary, 2 pp., processed, 1963. Small Business Administration, Washington D. C. 20416. A retailer should develop pricing guides based on his costs and the tastes and incomes of his customers. The percentage of markup should be determined on the basis of how demand for the item responds to changes in price. "Market-basket pricing" considers the impact of the price of an item on total store sales and profits. A survey of 14 supermarkets found that each firm, while responding to market pressures, was able to maintain some independence and thus to develop varied profit opportunities.

SMOKING:

Fish Smoking, by G. H. O. Burgess and A. McK. Bannerman, 44 pp., printed, 60 cents, 1963. British Information Services, 845 3rd Ave., New York 22, N. Y. The Torry kiln was developed in 1939 in an attempt to produce a fish-smoking kiln capable of turning out a high quality uniform product without the disadvantages of the traditional kiln. Although the Torry kiln has now been widely adopted by the British fish-smoking industry the Torry Research Station believes that the commercial operation of the kilns could be improved. This handbook gives advice to the kiln operator and to management. It will be useful both to the operator and to individuals who want to know whether or not to install a kiln of this type.

SOUTH AFRICAN REPUBLIC:

Sixteenth Annual Report of the Director, 1962, 107 pp., printed, 1963. Fishing Industry Research Institute, Cape Town, South Africa Republic.

SOUTH AMERICA:

Anuario de Pesca (Yearbook), 1962-1963, 287 pp., illus., printed in Spanish, $7. Ediciones Sudamerica S. A., Av. Wilson 911, Oficina 304, Apartado 2218, Lima, Peru. Contains articles on: "Las 2 Caras de Sudamerica" (The 2 Faces of South America); "Horizontes Oceanicos de Sudamerica" (Oceans' Horizons of South America), by Zacarias Popovici; "Recursos Marinos en Chile, Ecuador y Peru" (Marine Resources of Chile, Ecuador, and Peru), by Robert Clark; "Chile--Grandes Planes" (Chile--Great Plans); "Argentina; Vacas contra la Pesqueria" (Argentina: Cattle Against Fisheries); "Uruguay, el Estado-Pescador" (Uruguay, the Fishermen's State); "Brasil para los

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Brasilenos" (Brazil for the Brazilians); "Venezuela, Mar de Recursos Desconocidos" (Venezuela, Sea of Unrecognized Resources); and "Colombia Tiene Mar Pero no Pesca" (Colombia Has a Sea but no Fishery); "Ecuador, Grande en Atun y Camaron" (Ecuador, Great in Tuna and Shrimp); "Peru: Pura Anchoveta" (Peru: Pure Anchovies); "La Pesca Peruana en Cifras" (The Peruvian Fishery in Figures), by Isaac Vasquez; "Harina y Aceite, Industrias Grandes: (Meal and Oil, Great Industries), by Nicolas Corrochano V. A directory of the Peruvian fishing industry includes sections on fishing firms, producers of fish meal and oil, producers of canned fish, producers of frozen fish, manufacturers of whale meal and oil, suppliers for the fishing industry, and the Peruvian anchovy fishing fleet.

SOUTH CAROLINA:
Annual Report, 1962-1963, Contributions from Bears Bluff Laboratories No. 39, 10 pp., illus., printed, January 1964. Bears Bluff Laboratories, Wadmalaw Island, S. C. (Reprinted from Report of South Carolina Wildlife Resources Department, Fiscal Year July 1, 1962-June 30, 1963.) Discusses the accomplishments of the Bears Bluff Laboratory during the year ended June 30, 1963, covering the study of oysters, shrimp, finfish, and pond cultivation. Also covers hazards of pesticides to the fisheries, the formation in South Carolina of an oystermen's association, a cooperative oceanographic cruise, and construction of a new research vessel.

SPAIN:
"La Exportacion de Galicia en 1962. II--Analisis Global" (Exports from Galicia in 1962. II--Over-All Analysis), article, Industrias Pesqueras, vol. 37, no. 877, November 1, 1963, pp. 433-434, printed in Spanish, single copy 40 ptas. (about 65 U. S. cents). Industrias Pesqueras, Policarpo Sanz, 21-2°, Vigo, Spain. Shows exports of canned fishery products 1957-1962.

"La Exportacion Gallega de Conservas de Pescados" (Galicia's Exports of Canned Fishery Products), article, Industria Conservera, vol. 29, no. 293, November 1963, pp. 310-313, printed in Spanish. Union de Fabricantes de Conservas de Galicia, Calle Marques de Valladares, 41, Vigo, Spain.

"La Produccion Pesquera Espanola en 1963--Perspectiva Global" (Spanish Fishery Production in 1963--Over-All View), by Mareiro, article, Industrias Pesqueras, vol. XXXVIII, no. 881, January 1, 1964, pp. 8-9, printed in Spanish, single copy 50 ptas. (about 85 U.S. cents). Industrias Pesqueras, Policarpo Sanz 21-2°, Vigo, Spain.

SPOILAGE:
Autolytic Changes in the Lipids of Fish Flesh, by J. A. Lovern, Torry Memoir No. 106, 8 pp., illus., printed. (Reprinted from Recent Advances in Food Science, 1962, pp. 194-201.) Torry Research Station Aberdeen, Scotland.

"Degradation of Adenine- and Hypoxanthine-Nucleotide in the Muscle of Chill-Stored Trawled Cod (Gadus callarias)," by N. R. Jones and J. Murray, article, Journal of the Science of Food and Agriculture, vol. 13, 1962, pp. 475-480, illus., printed. The Society of Chemical Industry, 14 Belgrave Square, London SW1, England.

STERN TRAWLERS:
"Germany's Newest Stern Trawler," article, Fishing News, no. 2586, 1962, p. 3, illus., printed. Suite 27, 110 Fleet St., London EC4, England.

"A New Trawler to Solve Some Problems," by C. Birkhoff, article, Fishing News International, vol. 1 no. 3, 1962, pp. 46-49, illus., printed. A. J. Heighway Publications Ltd., 110 Fleet St., Ludgate House, London EC4, England.

"The Stern Trawler, Pioneriro," article, Shipping World, vol. 147, no. 3600, 1962, p. 110, illus., printed. Shipping World, 127 Cheapside, London EC2, England.

SUBMARINES FOR FISHERY RESEARCH:
"Soviet Research by Submarine," article, World Fishing, vol. 13, no. 1, January 1964, pp. 40-41, illus., printed, single copy 3s. (about 42 U.S. cents). Grampian Press Ltd., The Tower, 229-243, Shepherds Bush Rd., Hammersmith, London W6, England. Reviews the history of the use of submarines for fishery research and discusses the conversion of a Soviet Navy submarine for this purpose. This consisted of removal of torpedo tubes and substitution of a scientific laboratory; addition of 3 portholes and a television camera for observation, echo-sounders, a direction-finder, and an instrument for instantaneous measurement of water temperature and salinity. Instruments for taking samples of the bottom, for measuring illumination, and for analyzing sea water were also added. The submarine became operative in December 1958.

"Soviet Research by Submarine. Part Two--Observing Herring Underwater," article, World Fishing, vol. 13, no. 2, February 1964, pp. 45-48, illus., printed, single copy 3s. (about 45 U.S. cents). Grampian Press Limited, The Tower, 229-243, Shepherds Bush Rd., Hammersmith, London W6, England. Describes activities of the Soviet fisheries research submarine, Severyanka, in the Barents Sea during 1958-59. Observations were made of plankton densities, as well as activities of herring shoals. Variable light sensitivity in herring was demonstrated.

SUCKERS:
Suckers, by Frank J. Schwartz, Educational Series No. 58, 6 pp., illus., printed. Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

SYMBIOSIS:
Symbiotic Behavior between Small Fishes and Jellyfishes, with New Data on that between the Stromateid, PEPRILUS ALEPIDOTUS, and the Scyphomedusa, CHRYSAORA QUINQUECIRRHA, by Romeo Mansueti, Contribution No. 216, 41 pp., illus., printed. (Reprinted from Copeia, no. 1, March 1963, pp. 40-80.) Natural Resources Institute, University of Maryland, Chesapeake Biological Laboratory, Solomons, Md.

TAIWAN:
Fishermen's Association in Taiwan, by J. L. Chen, FAO Occasional Paper 63/15, 3 pp., printed, 1963. Regional Office for Asia and the Far East, Food and Agriculture Organization of the United Nations, Bangkok, Thailand.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

TARIFF AND TRADE:

Operation of the Trade Agreements Program, 14th Report, July 1960-June 1962, TC Publication 120, 163 pp., processed, 1964. Secretary, U. S. Tariff Commission, Washington, D. C., 20436. During the period covered by the 14th report, the Contracting Parties to the General Agreement on Tariffs and Trade (GATT) sponsored multilateral tariff negotiations. At the 1960/62 GATT tariff conference, negotiations were conducted with respect to: (1) the common external tariff of the European Economic Community, (2) new or additional concessions by some of the contracting parties, (3) concessions by certain countries acceding to GATT, and (4) revision of certain existing concessions by some of the contracting parties. The report also covers major developments relating to the general provisions and administration of the GATT, actions of the United States relating to its trade agreements program, and major commercial policy developments in countries with which the United States has trade agreements.

TAXONOMY:

The Genera of Fishes and a Classification of Fishes, by David Starr Jordan, 816 pp., printed, 1963, $17.50. Stanford University Press, Stanford, Calif. This is a reissue of an outstanding work, "The Genera of Fishes." Although long recognized as a classic in zoological taxonomy, it has been out of print since the early 1930's. However, the reissue has been coupled with the publication of "A Classification of Fishes." Together these two works have been the bible of two generations of ichthyologists and have been instrumental in achieving a stable nomenclature and a general classification of both fossil and living forms. Today Jordan's works still remain a prime reference tool for the taxonomist. The new Foreword by George S. Myers, Stanford University, sets the work in the perspective of today's knowledge. Thus a guide is provided for correlating newer names and groups with those of Jordan's classification. "The Genera of Fishes" consists of four parts: Part I--From Linnaeus to Duvier, 1758-1833; Part II--From Agassiz to Bleeker, 1833-1858; Part III--From Guenther to Gill, 1859-1880; Part IV--From 1881-1920. "A Classification of Fishes" places each genus and subgenus, living and fossil, named or described, whether valid or not, in its proper family and the families themselves are arranged in as natural a sequence as is possible with a linear series which embraces highly divergent lines of evolution. The book also contains a comprehensive Index, printed here for the first time although used in manuscript form for 20 years. This book is indispensable to any research involving the zoological nomenclature and bibliography of fish. It is a must for any reference library on fish and fisheries.

--Joseph Pileggi

TELEOSTS:

"Electron Microscopic Observation on Liver of Teleost, Ctenochaetus striatus," by T. Kantani, article, Yamaguchi-Igaku, vol. 12, no. 1, March 1963, pp. 35-40, printed in Japanese. Yamaguchi Idai, Igakkai, Ogushi, Ube, Yamaguchi, Japan.

"Electron Microscopic Observation on Stomach of Teleost, Ctenochaetus striatus," by T. Yokota, article, Yamaguchi-Igaku, vol. 12, no. 1, March 1963, pp. 14-19, printed in Japanese. Yamaguchi Idai, Igakkai, Ogushi, Ube, Yamaguchi, Japan.

TOXICITY:

"Fish Poisoning. A Problem in Food Toxication," by A. F. Bartsch and E. F. McFarren, article, Pacific Science, vol. 16, 1963, pp. 43-56, printed. Office of Publications, University of Hawaii, Honolulu 14, Hawaii.

TRAWLERS:

"Le Chalutier-Usine Russe Leskof de 2670 T.J.B." (The Russian Factory-Trawler Leskof of 2,670 Metric Tons), article, La Peche Maritime, vol. 42, no. 1027, October 1963, pp. 690-692, illus., printed in French, 12 F (about US$2.45). Les Editions Maritimes, 190, Boulevard Haussmann, Paris, France.

TROUT:

This Wonderful World of Trout, by Charles K. Fox, 296 pp., illus., printed, $7.50, 1963. Foxcrest, Carlisle, Pa.

TROUT AND SALMON:

Trout and Salmon Culture (Hatchery Methods), by Earl Leitritz, Fish Bulletin No. 107, 213 pp., illus., printed in Japanese with English references, reprinted January 1960. Printing Division, Documents Section, N. Seventh St. at Richards Blvd., Sacramento 14, Calif.

TUNA:

Observations on the Economy of the Tuna Fisheries, 69 pp., illus., printed in Japanese, limited distribution, August 1963. Fishery Agency, Tokyo, Japan.

"Practical Considerations on Green Discoloration of Tropical Tuna," by J. F. Aldrin, article, Revue de la Conserve, vol. 17, no. 7, 1962, pp. 147-151, printed in French. Societe d'Edition pour l'Alimentation, rue de la Reale, Paris I, France.

Some Technological Aspects of the Norwegian Tuna Purse Seining Fishery, by Johannes Hamre, 14 pp., illus., printed. (Reprinted from Reports on Norwegian Fishery and Marine Investigations, vol. 13, no. 6, 1963.) Fiskeridirektoratet, Bergen, Norway. Gives an account of the development of the Norwegian tuna fishery, including a brief description of the purse-seine method used at present, and a consideration of its efficiency compared to the American technique. Discusses the construction of the net, the fishing operation, the sinking velocity and the operation depth of the net, and some theoretical considerations on net constructions. The combination of a short but strong bunt with a long wing made of very light material has enabled the Norwegian fishermen to construct a purse seine strong enough to hold a giant bluefin and at the same time be manageable for the fishing operation. The object in choice of net design is to obtain the largest catching capacity of the net for the smallest cost of material and power requirement under actual fishing conditions.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

"Test Purse Seining for Tuna Using the Fish Boat Thynnus," by C. G. du Plessis, article, The South African Shipping News and Fishing Industry Review, vol. XIX, no. 1, January 1964, pp. 86-87, 89, 91-93, illus., printed, single copy 30¢ (about 45 U.S. cents). Thomson Newspapers, South Africa (Pty.) Ltd., 8th Floor, Trust House, Thibault Sq., Box 80, Cape Town, South Africa Republic. The purpose of experiments carried out with the Thynnus was to establish whether tuna could be caught in South African waters with a purse seine operated from a standard local type of pilchard fishing vessel. The vessel is 61 feet long, 42.19 net tons, and of wooden construction. Fishing was conducted between mid-July 1962 and mid-August 1963 off the coast of South Africa. Because of bad weather, only 6 throws were made, none of which was successful. However, the Fisheries Development Corporation of South Africa has decided to continue the work pioneered by the Thynnus, and has recently enlisted the part-time services of a 72-foot pilchard fishing boat.

TURKEY:

Balik ve Balikcilik (Fish and Fishery), vol. XII, no. 2, February 1964, 32 pp., illus., printed in Turkish with English table of contents. Et ve Balik Kurumu G. M., Balikcilik Mudurlugu, Besiktas, Istanbul, Turkey. Includes, among others, these articles: "The Sponges (Part I);" "The Postmortem Changes in Turkish Sea-Water Fishes (Part I);" and "Basic Researches on the Development of Fishery in Turkish Fresh-Waters, Lakes and Dams (Part II)."

UNITED ARAB REPUBLIC:

Selling in the United Arab Republic, by Roger D. Severance, OBR 63-160, 8 pp., printed, 15 cents, December 1963. Bureau of International Commerce, U. S. Department of Commerce, Washington, D. C. (For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., 20402.) With a few exceptions, foreign suppliers selling in the U.A.R. deal with the Government. Fifteen government trading or import companies, supervised by the Egyptian General Trade Organization under the Ministry of Economy, have the responsibility for importing all goods that are not imported directly. The report discusses the road to selling--representation, direct selling, import requirements, consumer goods, industrial goods, and transportation, port, and storage facilities; commercial practices (wholesale and retail channels, credit terms and facilities, and trade customs); and market aids (advertising media, market research and trade organizations); and United States aids. Also covers Government procurement; selling under United States programs--A.I.D. loans, P. L. 480 assistance, export insurance, and export guarantees; and notes for business travelers.

U.S.S.R.

Notes from Soviet Fisheries Journals, no. 7, by Donald E. Bevan and Ole A. Mathisen, Circular No. 192, 26 pp., illus., processed, May 1963. Fisheries Research Institute, College of Fisheries, University of Washington, Seattle 5, Wash. Includes, among others, these items: "Strengthening and Developing International Relations in the Field of Fisheries;" "Biological Data on Pink Salmon Transplanted to White Sea and the Barents Sea;" "A Review of the Work of the Fishing Industry in 1962;" "Experiments on Transplantation of the Pacific Shrimp to the Black Sea;" "Catch of Flounder in the Bering Sea."

Rybnoe Khoziaistvo, vol. 50, no. 1, January 1964, 96 pp., illus., printed in Russian, single copy 50 Kopecks (about 56 U. S. cents). Rybnoe Khoziaistvo, B-140, V. Krasnosel'skaia 17, Moscow, U.S.S.R. Includes, among others, articles on: "Let Us Increase the Catches of Fish;" "The Further Development of Pond Fish Culture in the U.S.S.R.;" "For a Rational Organization of Herring Fishing in the White Sea," by I. I. Bagautdinov; "The Structure of the Sturgeon Catch in the Caspian Sea," by N. I. Kozhin; "Efficacy of Measures to Increase the Ladoga Salmon Stocks," by Z. A. Boiarskaia; "Method of Unloading Vessels in the Open Sea without Moorings," by S. M. Rudnitskii; "Improved Rigging of 15/21 Trawl Used in Ocean Perch Fishing," by B. K. Zhukov; "The Introduction of Purse Seining on the SRTR-400 Rubtsovsk," by Iu. Moskal'tsov; "How to Lower the Costs of Trap Nets;" and "Rational Exploitation of the Fishery Resources," by F. I. Baranov.

--M.A. Kravanja

Rybnoe Khoziaistvo, vol. 50, no. 2, February 1964, 95 pp., illus., printed in Russian, single copy 50 Kopecks (about 56 U. S. cents). Rybnoe Khoziaistvo, B-140, V. Krasnosel'skaia 17, Moscow, U.S.S.R. Includes, among others, these articles: "Fishermen and the 7-Year Plan;" "Biological Principles of the Fishery Regulations in the Sea of Azov," by A. N. Smirnov and V. M Naumov; "A Method to Determine the Abundance of Atlantic Salmon in the Pechora River," by O. A. Azernikova; "The Effect of Temperature Factor in the Culture of Young Salmon," by I. N. Petrenko; "More Attention to the Mechanization of Loading and Unloading Operations in Fishery Ports," by T. P. Shumilova; "A Trawl for Shrimpers," by V. S. Dolbish and others; "A New Refrigerated Plant in the Fishing Port of Nakhodka," by V. I. Matveev; and "Fish-Freezing Plant Aboard Vessel," by V. K. Vasil'ev.

--M.A. Kravanja

Translations from RYBNOYE KHOZYAYSTVO (Fishing), No. 1, 1962, OTS 63-31096, 26 pp., illus., processed, 75 cents, 1963. (Translated from the Russian, Rybnoye Khozyaystvo, no. 1, January 1962, pp. 9-13, 26-32, 32-36.) Office of Technical Services, U. S. Department of Commerce, Bldg., T-30, Ohio Dr. and Independence Ave. SW., Washington, D.C., 20235. Includes articles on: "Saury," by S. I. Apanovich; "Quantitative Assay of Baltic Cod Concentrations by Means of a Sonic Depth Finder," by K. I. Yudanov; and "Underwater Observations of the Behavior of the Caspian Kilka," by I. V. Nikonorov.

VESSELS:

"All-Aluminum Menhaden Vessel," by Joe D. Smith, article, Fishing News International, vol. 2, April-June 1963, pp. 151-152, printed. A. J. Heighway Publications Ltd., 110 Fleet Street, London EC4, England.

"Problems Associated with the Development of Fisheries in Tropical Countries. I--Mechanization of Fishing Boats," by R. C. Cole and L. H. Greenwood-Barton, article, Tropical Science, vol. 4, no. 3, 1962. pp. 127-146, illus., printed. Tropical Products Institute, 56/62 Grays Inn, London WC1, England.

THESE PUBLICATIONS ARE NOT AVAILABLE FROM THE FISH AND WILDLIFE SERVICE, BUT USUALLY MAY BE OBTAINED FROM THE ORGANIZATION ISSUING THEM.

Refrizheratornye Suda (Refrigerator Ships), by V. P. Zaitsev, R. 28287, printed in Russian, 1963. (Available on loan from the National Lending Library for Science and Technology, D.S.I.R., Boston Spa, Yorkshire, England.)

VIRGIN ISLANDS:
An Analysis of the Fish Populations of Artificial and Natural Reefs in the Virgin Islands, by John E. Randall, 18 pp., printed. (Reprinted from Caribbean Journal of Science, vol. 3, no. 1, March 1963, pp. 31-47.) University of Puerto Rico, Faculty of Arts and Sciences, Institute of Caribbean Science, Mayaguez, P. R.

VOCATIONAL EDUCATION:
Fishing, Choice of Careers No. 90, 40 pp., printed, 1961. Her Majesty's Stationery Office, York House, Kingsway, London WC2, England

WATER RESOURCES:
"Water Resources Research in the Federal Government," by Roger Revelle, article, Science, vol. 142, no. 3595, November 22, 1963, pp. 1027-1033, printed, single copy 35 cents. American Association for the Advancement of Science, 1515 Massachusetts Ave. NW., Washington, D.C., 20005.

WESTERN PACIFIC:
Sbornik Dokladov po 2 Plenume Komissii po Rybokhoziaistvennomu Issledovaniiu Zapadnoi Chasti Tikhogo Okeana (Collection of Papers Read at the Second Plenum of the Commission on the Study of Fish Economy of the Western Part of the Pacific), edited by P. A. Moiseev, R. 28159, printed in Russian, 1962. (Available on loan from the National Lending Library for Science and Technology, D.S.I.R., Boston Spa, Yorkshire, England.) Komissiia po Rybokhoziaistvennomu Issledovaniiu Zapadnoi Chasti Tikhogo Okeana.

WHALES:
Killer Whale!, by Joseph J. Cook and William L. Wisner, illus., printed, $3, 1963. Dodd, Mead and Co., 432 Fourth Ave., New York, N. Y., 10016.

WHALING:
"International Whaling Commission (Chairman's Report of the Fifteenth Meeting)," by M. N. Sukhoruchenko, article, Norsk Hvalfangst-Tidende (The Norwegian Whaling Gazette), vol. 53, no. 1, January 1964, pp. 1-6, 8, printed. Hvanfangerforeningen, Sandefjord, Norway. Discusses the agenda and accomplishments of the Fifteenth Meeting of the International Whaling Commission, July 1-6, 1963, London. Covers a review of the previous season's catch, the condition of the Antarctic whale stocks, the blue-whale unit limit, protection of humpbacked whales and blue whales, and the Antarctic baleen whaling season. Also covers the North Pacific whale stocks, size limits for sperm whales, taking of whales for scientific purposes, the observer scheme, infractions, finance, and other business.

WHITE SEA:
Biology of the White Sea. Works of the White Sea Biological Station, Moscow University, Vol. 1, 1962, (Review), by V. G. Bogorov, OTS 63-31661, 2 pp., printed, 50 cents, August 30, 1963. (Translated from the Russian, Zoologicheskii Zhurnal, vol. 42, no. 6 1963, p. 967.) Office of Technical Services, U. S. Department of Commerce, Washington, D. C., 20235.

WHITING:
The Scottish Whiting Fishery in the North Sea 1955-60, by Ray Gambell, Marine Research 1963, No. 4, 31 pp., printed. Department of Agriculture and Fisheries for Scotland, Edinburgh, Scotland.

GIANT BOULDER LANDED BY BRITISH TRAWLER

A four-ton boulder (considered to be the largest ever to be brought up by conventional trawl gear) was landed at Grimsby in late 1963 by the British trawler Okino. Taken from the fishing area known as the "Silver Pits" in the North Sea, the boulder has probably caused damage to fishing gear for years. It took seven hours to stow on deck, a hazardous undertaking which could have sunk the vessel if the rock had dropped. The cost to the trawler owners was well over £100 (US$280) in lost time and fish. But only two meshes were broken in the cod-end which was made of synthetic fiber of great strength.

Another demonstration of the strength of synthetic fiber was the netting of a 2½-ton boulder in a polypropylene trawl by the British trawler Ross Mallard in December 1962.

Note: See Commercial Fisheries Review, May 1963 p. 89.

QUESTIONS FREQUENTLY ASKED ABOUT CANNED FOODS

Consumers frequently ask the Food and Drug Administration these questions about canned foods:

1. Where should I store canned foods? Canned foods may be stored any place. The best storage is in a dry place at moderately cool, but not freezing, temperatures. Storage near steam pipes, radiators, furnaces, and kitchen ranges should be avoided.

2. How long will canned foods keep? Canned foods will keep just as long as nothing happens to the can or jar to make it leak. Extremely long periods of storage at high temperatures may result in some loss in color, flavor, appearance, and nutritive value, but the foods will remain wholesome. It is probably best to have a regular turnover, say, once a year.

3. What effect has freezing on canned foods? There may be a slight breakdown of texture of a few products, but otherwise a single freezing and thawing does not affect canned foods adversely. Some creamy foods may curdle or separate upon freezing, but heating usually restores the original consistency.

4. Does damage to the outside of a can mean the food is damaged? Rust or dents do not affect the contents of the can as long as the can does not leak. However, any container that leaks or bulges should be discarded.

5. Is it safe to leave unused portions of canned foods in the can after opening? Yes, it is safe to leave food in the open can. It is important, however, to place the can in the refrigerator, just as you would any other cooked food. Acid foods, such as grapefruit juice, may dissolve a little iron from the open can if it stands in the refrigerator for any long period of time. This metal is not harmful or dangerous to health, but the food may have a metallic taste. If such a product is not going to be consumed within a short time, it probably would be preferable to empty the contents into a glass jar or other container.

6. What about the composition of cans themselves? I sometimes notice discoloration in the food or in the liner of the can. The Food Additives Amendment to the Federal Food, Drug, and Cosmetic Act prohibits the use of food containers which would transfer a poisonous or harmful substance to the food in the can. Consumers may be confident of the safety of the cans found in the market.

However, a harmless discoloration sometimes does occur either in the can liner or in the food itself. This is one example: during the processing necessary for sterilization, some vegetables and meats liberate sulfur. This often causes a mottling of the inside surface of the can, in various shades of brown, blue, or black. This is due to the formation of tin sulfide and sometimes also iron sulfide. Food scientists state, however, that the sulfide stain does not harm the contents, and is merely unsightly. (FDA Memo for Consumers from the Food and Drug Administration, U. S. Department of Health, Education, and Welfare, February 10, 1964.)

PORPOISE AND DOLPHIN RAVAGE FISHERMEN'S CATCH AND GEAR

The porpoise and his larger cousin, the dolphin, are often thought of as man's best friends in the sea. Fond of humans, remarkably intelligent, incurable show-offs, both those mammals are popularly painted as playful princes of the deep. This view is not shared by the fishermen of the Mediterranean. From Barcelona to Beirut, from Trieste to Tripoli, porpoise and dolphin alike are detested as pests, robbers, and natural enemies of all who make their living from the sea.

A study of the General Fisheries Council of the Mediterranean (GFCM), written by C. Ravel of France and published recently through the Food and Agriculture Organization, gives the reasons for the fishermen's hostility.

Here are a few: Porpoise and dolphin annually destroy or seriously damage thousands upon thousands of fishing nets--not only nets used near the shore but trawls working over the continental shelf at depths up to 400 feet.

Year after year those animals chase away schools of tuna the fishermen have sometimes tracked for days.

Propoise and dolphin feed on diminishing stocks of sardine, anchovy, sole, and other fish that make up the bulk of the Mediterranean catch.

Italian fishermen report that porpoise alone cost them about $500,000 a year in destroyed or damaged nets. The French estimate damage to gear at $400 per boat for the Mediterranean fishing fleet. The Spaniards say the porpoise damages or destroys up to 20,000 items of gear a year. Dolphin are a major threat to the prize bluefin tuna fisheries off Morocco's north coast. Yugoslavia, with an average of 3,000 nets ruined and 6,000 damaged, reckons its yearly losses to those animals at about $270,000.

What is doubly galling to the fishermen is that the porpoise and the dolphin have public sympathy on their side. Any Mediterranean-wide campaign against them would probably set off a chain of protests. Admiration for the porpoise and the dolphin goes back to ancient times. Greeks and Romans saw the dolphin as a noble, even divine, creature. Homer called the dolphin "the King of Fishes and Lord of the Sea." He also said that to hunt the dolphin was sinful and displeasing to the Gods. Pliny cited the dolphin as a savior of drowning men and a fierce fighter of crocodiles in the Nile.

Despite the porpoise-dolphin's established public relations image, the fishermen do what they can in their own defense. They use a variety of attacks:

Porpoises and dolphins are shot with rifles--without much real effect on their numbers. Underwater detonators and grenades scare them away but seldom kill them. Poisons are poured in the sea where they are thought to collect--usually without impressive results. Ultrasonic wave emitters frighten them away from fishing boats--temporarily. Once the echo-sounders are shut off, the "divine creatures" come swarming back. Other methods are tried--with indifferent success.

The GFCM study offers one solution: eat them. Ravel's study says that "porpoise hunting might perhaps be intensified if porpoise meat could be marketed in the ordinary way."

He points out that although porpoise meat is little eaten in his own country (its bright red color is considered shocking), there is no reason why the meat could not achieve popularity.

(Continued on next page)

"It tastes very good, rather like venison. Certain cuts--fillet, tongue, brains, liver and kidney--are special delicacies. In other countries, such as England and Italy, porpoise meat is highly esteemed and eaten quite normally.

"In Canada," the study continues, "canned dolphin meat is an enormous success, so that its poor reputation elsewhere is quite undeserved and ought to be changed. Porpoise meat should find the place it used to enjoy on the market and this would probably be the best way of keeping down the numbers of those animals."

A good way of combatting the Tursiops species of dolphin, Ravel recommends, is to "harpoon them on sight." Thus Mediterranean fishing boats, especially those engaged in tuna and sardine fishing, would do well to keep harpoons aboard "so as to deal with the Tursiops when they start prowling around the boat."

Of all the Mediterranean nations only Turkey has really gone after the dolphin properly. The Turks hunt the animal with military rifles from motor boats of 20 to 150 horsepower. Each rifleman is issued 1,500 bullets and in years when there are plenty of dolphin the Turks may kill from 5,000 to 8,000 tons.

"Turkey, therefore," the study states, "has organized dolphin hunting in a truly systematic, businesslike fashion, so that the predators do not overabound in Turkish waters and thus do not cause serious damage to the fishermen's nets."

Significantly the Turks like porpoise and dolphin meat and its marketing helps out a great deal in supplying the population with high-grade protein.

Ravel's final recommendation is the use of underwater acoustic signals. As porpoise and dolphin are known to communicate with one another by such signals, he thinks that it may soon be possible to keep them at bay by transmitting their own alarm or distress signals.

"In other circumstances," his study concludes, "different signals might be used to attract those creatures to specific points, so that they may be caught and killed by the appropriate means."

SOLAR STILLS PURIFY SEA WATER IN INDIA

In northern India where the sun shines brightly most of the year, methods for evaporating and distilling water in solar stills are being studied. The stills are in general airtight glass-roofed enclosures exposed to the sun in which brackish water or sea water is allowed to evaporate and condense along the walls. The distilled water is then collected in troughs along the sides of the still. Experiments so far have indicated that a low-roof type of solar still is the most practical in the remote arid areas where the only water supply is underground brackish water.

The yield from the stills is fairly constant and installation fairly inexpensive. About 14 to 20 square feet of distilling area is required to produce a gallon of distilled water per day. A daily yield of about 1,500 gallons per acre would be sufficient to maintain a village community of about 250 persons.

The study was reported in the Indian Journal of Scientific and Industrial Research. ("Science News Letter," 83:30, January 12, 1963.)

U.S. BUREAU OF COMMERCIAL FISHERIES

The U.S. Bureau of Commercial Fisheries and the agencies that preceded it have a history of interest in the country's fisheries which extends back to 1871. In 1939, fishery activities were transferred from the U.S. Department of Commerce to the U.S. Department of the Interior and consolidated with the Bureau of Biological Survey to form the Fish and Wildlife Service.

Regional and area boundaries, U.S. Bureau of Commercial Fisheries.

The Fish and Wildlife Act of 1956 provided, in the U.S. Department of the Interior, a Fish and Wildlife Service composed of the Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries. This Act recognized fish and shellfish as a valuable resource, important to the Nation's future. It also directed the Bureau to manage wisely the marine resources and to help maintain a strong and prosperous fishing industry.

As a result of the Fish and Wildlife Act of 1956, the activities of the Bureau of Commercial Fisheries were regionalized to establish closer contact at the field level.